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# **BLINDNESS**

## **1966**

### **AAWB**

AMERICAN ASSOCIATION OF WORKERS FOR THE BLIND, INC.

### **ANNUAL**

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# PREFACE

BLINDNESS 1966 is the third issue of an annual published by the American Association of Workers for the Blind under a training grant from the Vocational Rehabilitation Administration, Department of Health, Education, and Welfare. It is our plan to provide a forum for important and timely articles—with depth—in our own field and in related fields. Experts in the many categories of work with blind persons will be commissioned to conduct the essential research and prepare the articles so that their continuing value will be assured.

Copies of BLINDNESS 1966 are distributed to members of the Association as a function of membership. The Library of Congress, Division for the Blind, will make the annual available for regional libraries in both braille and recorded form.



# BLINDNESS 1966

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LOUIS H. RIVES, JR. is Special Assistant in the field of civil rights to the Commissioner, Vocational Rehabilitation Administration, H.E.W. He was formerly Chief, Division of Services to the Blind, V.R.A.

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Mr. Salmon's article is supplemented by a chapter from Helen Keller's book, *Midstream—My Later Life*, entitled, "Our Mark Twain". This is a delightful account of a happy week-end spent by Miss Keller, her teacher, Anne Sullivan Macy, and Mr. John Macy at Mark Twain's estate in Stormfield, Conn. This is the 100th anniversary of Anne Sullivan Macy's birthday.

PETER J. SALMON, Administrative Vice-President, The Industrial Home for the Blind, is project director of a Vocational Rehabilitation grant to develop services for the deaf-blind on a regional basis. A tribute to him as "Friend of the Deaf-Blind" by Joseph Hunt (V.R.A.) accompanies this article.

HERBERT RUSALEM is a research staff member of the Industrial Home for the Blind.

## The Canadian National Institute for the Blind— a Study in Achievement; and Col. Eddie Baker: A Portrait

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In this instance both titles are self-explanatory.

COL. E. A. BAKER is Honorary President and A. N. MAGILL is the Managing Director of the Canadian National Institute for the Blind, Toronto, Canada.

MARJORIE CAMPBELL, author of the "Portrait" is also author of "No Compromise—the Story of Col. Baker and the C.N.I.B.", published in 1965.

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*SALVATORE G. DiMICHAEL is the Regional Representative, Region II (Del., N.J., N.Y., and Penna.), Vocational Rehabilitation Administration, H.E.W.*

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*BERTHOLD LOWENFELD was, for many years, the Superintendent of the California School for the Blind in Berkeley; he is presently a research professor at San Francisco State College and Editor of the Bulletin of the American Psychological Association on Psychological Aspects of Disability.*

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*GEORGE A. MAGERS is a Consultant, Guidance, Training and Placement of the Blind, Division of Services to the Blind, Vocational Rehabilitation Administration, H.E.W.*



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JOSEPH F. CLUNK *was the first Chief, Division of the Blind, Vocational Rehabilitation Administration, H.E.W. He is now with the Maryland Workshop for the Blind, Baltimore, Maryland.*

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GEORGE G. MALLINSON *is Dean, School of Graduate Studies, Western Michigan University, Kalamazoo, Michigan.*

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HOWARD FREIBERGER *is an Electronics Engineer, Research and Development Division, PSAS, U.S. Veterans Administration.*

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Diderot's Letter on the Blind for  
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MR. BLEDSOE is the author of the accompanying  
"Portrait" of Denis Diderot.





# THE STORY OF A LAW

*By Louis H. Rives, Jr.*

We may think of a law in many different ways. To some, a law may be complex verbiage in finely printed columns in a dusty statute book. Again, it may be the city ordinance upon which your last parking ticket was based, the act of the State legislature which fixes the beginning of the fishing season, or the Internal Revenue act which requires our payment of income taxes. Upon deeper reflection, we may realize that each law is one of the rules which society imposes upon itself for playing the game of life.

While our opinions and attitudes toward any particular law may vary with the manner and degree in which it touches our individual lives, there is one thing that all laws have in common — each law is the matrix or focus of a story, a story which begins with an idea, follows it through a process of development and refinement until it matures into a legislative proposal or proposals.

## Legislation Fascinating Story

The story then continues through the process of legislative hearings and debates. Here the tale may be one of intense and bitter controversy, of political maneuvering, of artful compromise and of courageous statesmanship. Or on the other hand, it may be a story of quick action in response to some national emergency or need, when individual differences are quickly resolved in the common interest. Nor is the story over when a particular law is passed. The press of changing times means that before the ink is dry new forces are starting the process over again, writing a new chapter leading to a new law in the fascinating story of how our society meets and deals with the problems of the day.

There is perhaps no better way to gain a grasp and perspective of a great nation's efforts to improve the lot of its people who are blind than through studying the story of each piece of Federal legislation which affects them. By reading the legislative hearings, the Congressional debates, the statements made at the time by leaders in work for the blind who were for or against particular proposals, we can recapture the flavor and spirit of each movement forward in building a comprehensive national program to meet the needs of blind people.

## Start of Program of Books for Blind

For example, we can recapture the excitement among the members of the American Association of Instructors of the Blind when Samuel Gridley Howe realized that voluntary effort alone could not assure the provision of adequate books for blind children and threw his great influence into the fight for Federal legislation to provide books for blind children. This resulted in the passage of

the first piece of Federal legislation specifically benefiting the blind, approved March 3, 1879.\* Under this act, entitled "An Act to Promote the Education of the Blind," an annual sum of \$10,000 was made available to provide books and educational material to blind children throughout the country. From this beginning has come the ever-expanding program of books for the blind which we know today. Each of the amendments to this basic act tells a story of increasing need of blind people for educational material and of the willingness of our National Government to meet this need once it is made clear.

Just as interesting is the story of the passage of the Pratt-Smoot Act in 1931 which established in the Library of Congress the immeasurably important program through which blind people all over the United States can borrow, without cost, an ever-increasing number of braille and recorded books.

The stories of the Social Security Act of 1935, which for the first time committed the Federal Government to participate in the financial support of blind people, the Randolph-Sheppard Act of 1936 which recognized that blind persons could perform successfully as operators of vending stands in Federal buildings, and the Wagner-O'Day Act of 1938 which gave a special preference to workshops employing blind persons in purchases made by the Federal Government are all interesting and are filled with differing philosophies, with suspense, horsetrading, controversy, and finally, accomplishment.

### Began With 1920 Legislation

In my mind, perhaps because I live closest to it and know it best, is the story of the Vocational Rehabilitation Act Amendments of 1965. This act is the most recent chapter of the continuing story of national legislation to assist disabled people regardless of the cause of their disability to lead full, useful and productive lives.

The story began with the passage of the Smith-Fess Act which was signed by President Wilson on June 2, 1920. This act provided for an appropriation of \$750,000 for fiscal year 1921 and \$1 million for fiscal years 1922 to 1924, for payments to States cooperating in vocational rehabilitation of persons disabled in industry or otherwise. Services under this first act were confined to counseling, job training, artificial limbs and other prosthetic appliances, and job placement. Federal funds were divided among the States on a population basis and each State was required to spend a dollar of its own funds in order to receive a dollar of Federal funds. The Federal Board of Vocational Education was given responsibility for carrying out the act. In the States, the responsibility was vested in State Boards of Vocational Education. Authorization for the program was renewed in succeeding years.

### Pronounced Change Came in 1943

With the Social Security Act in 1935 came the first permanent authorization for this program, providing for increased aid to vocational rehabilitation in recognition of such work in a permanent program for economic security.

During this period, from 1920 until 1943, the vocational rehabilitation program had meant little to blind people. Few, if any, were accepted for services

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\* Stat. 1879, Ch. 186.



by State vocational rehabilitation agencies. Applicants who were blind were referred to State Commissions for the Blind (which received no Federal financial assistance) — or were rejected as poor risks for rehabilitation. In 1943, however, there was a great and pronounced change.

The comprehensive program for the rehabilitation of the disabled veterans of World War II gave impetus to a dramatic expansion in the vocational rehabilitation program for civilians. In the deliberations and debates surrounding this new law: The Barden-LaFollette Act which was signed by President Roosevelt on July 6, 1943, Page 2, P. L. 113-78.

Such persons as Robert Irwin, Francis Cummings, Barney Day, George Meyer and Pter Salmon fought long and hard to liberalize the provisions of the new law and to make sure that they would be fully applicable in assisting blind people in preparing for and finding gainful occupations. One key provision of the new law made it possible for the portion of the State plan, under which vocational rehabilitation services were provided blind persons, to be administered by State Commissions or other agencies serving the blind. This meant that commissions and other agencies for the blind, as well as rehabilitation programs for the blind located in State Departments of Welfare, for the first time, could receive Federal funds to assist in their programs of vocational rehabilitation.

#### Disability Definition was Broadened

The statute required, however, that even in States where there was a separate program for the blind, the Board of Vocational Education would have to retain general responsibility for accounting to the Federal government and for the approval of State plans. In practice, this requirement had little effect upon the operation and programs of the separate agencies for the blind. In addition to making it clear that blind people were eligible under the program and in opening up Federal financing of agencies for the blind, the 1943 law vastly expanded both the concept and financing of rehabilitation.

The definition of "disability" was broadened to include mental illness and mental retardation as well as physical impairments. The scope of rehabilitation services was expanded to include hospitalization, medical treatment and surgery, to reduce or remove a handicapping condition, and economic maintenance to assist an individual to take advantage of other rehabilitation services, in addition to those which had been authorized in previous acts, including diagnostic services, guidance, counseling, placement, prosthetic appliances, necessary training for the right job, training materials, occupational tools and equipment and suitable placement in gainful employment.

In the areas of financing, the 1943 law abandoned the old system of financing which provided for the division of a specific Federal appropriation among the States on the basis of population and required that each State spend a dollar of its own funds to earn a dollar in Federal funds within the allotment and substituted a so-called "open end" financing arrangement.

#### Steady Progress in 10-Year Period

Under this new system, the Federal Government undertook, without limitation, to meet 100% of the costs of administration of the State programs, of

guidance, counseling, placement costs, of the costs of rehabilitating war disabled civilians, and 50% of the costs of other rehabilitation services such as physical restoration, training and maintenance incurred by the State agencies in carrying out their programs.

The State agencies for the blind were quick to grasp the promise and potential of the new law. Staffs were increased many fold, the range of rehabilitation services was expanded, vigorous programs to place blind persons in industry were launched and the basic pattern of the State vocational rehabilitation agency as we know it today was set. For the next ten years, steady progress was made when thousands of blind people were rehabilitated into employment.

By the early 1950's, it became clear that changing times and changing needs were going to necessitate corresponding modifications in our basic vocational rehabilitation law. The "open end" financing provisions of the 1943 act were not in keeping with the times. Appropriations were not large enough to cover the expenditures which the States needed to make. This meant that each year the program would be mortgaged to pay last year's bills. There was an increasing awareness of the lack of qualified personnel and there was a ground-swell for improved research to find better ways of serving disabled people.

As a result of study, of hearing, in which there was full participation by organizations of and for the blind, a new law was drafted, passed by the Congress, and signed by President Eisenhower on August 3, 1954.

#### Summary of Major Changes

The major changes in the 1954 act were summarized as follows:

1. Financing provisions — The State's share under this act was determined by a formula which took into account the individual State's population and its per capita income. The object was to give greater financial support to States with relatively large populations and relatively small per capita income, calling for these States to pay smaller portions of the total cost of the State vocational rehabilitation program than other States with greater financial resources. The Federal share varied from 50 to 70 per cent, with the national average about three Federal dollars to two State dollars invested in vocational rehabilitation;
2. Extension and improvement project grants to States — A new system of project grants to State agencies — extension and improvement grants — provided Federal financial support at more favorable rates to induce States to develop new aspects of their programs and to extend their services to disability groups and geographical areas previously reached inadequately or not at all. Extension and improvement grants provided up to \$3 of Federal funds for each dollar invested by the State, up to a maximum of three years for each project;
3. Research and demonstration — Grants to encourage and support research into better rehabilitation and to conduct demonstrations across the country also were authorized for the first time. These grants are made to public and private nonprofit organizations, such as State rehabilitation agencies, voluntary groups, universities and rehabilitation facilities;



4. Training — Grants to support the training of more professional personnel for rehabilitation services included (a) long-term training grants to educational institutions and rehabilitation agencies for support of basic advanced professional training in the form of teaching grants, traineeship grants for students selected by the educational institution, or a combination of these two; (b) short-term grants for training less than a semester in duration, e.g., institutes, workshops, seminars and other training courses; (c) in-service training grants to State vocational rehabilitation agencies for staff development programs; and (d) rehabilitation research fellowships;
5. Rehabilitation facilities and workshops — the law also authorized for the first time the use of funds granted to the States for establishment (alteration or expansion) of rehabilitation facilities and workshops and for the initial staffing of rehabilitation facilities for a period not to exceed one year;
6. Randolph-Sheppard vending stand program for the blind — The 1954 amendments included features to strengthen the provisions for giving preference to blind persons in the operation of vending stands on Federal and other property;<sup>1/</sup>
7. The provision of the law relating to the designation of the agency to administer the vocational rehabilitation program in each State was revised to include State Boards of Vocational Education, independent agencies whose primary responsibility was vocational rehabilitation and with respect to the part of the plan relating to the blind, any agency authorized under State law to provide vocational rehabilitation services to the blind. As a result of this change, separate State agencies for the blind became directly responsible to the Federal Government without going through the State Boards of Vocational Education;
8. The Act also contained a temporary authority for direct Federal grants to public and other non-profit organizations and agencies to bring about a substantial expansion in the vocational rehabilitation program.

#### Brought Immediate Increases

Progress under the 1954 act was swift and far reaching. The improved financing provisions meant immediate increase in State and Federal support. During the next ten years, State and Federal funds increased almost three-fold to \$150 million a year and about a million people were rehabilitated into gainful employment. Through the research program, new and better ways were found to serve severely disabled clients, as shown in articles published in "Blindness 1964", "Blindness 1965", and in this issue on Page 169. Through the demonstration program, these new ideas were put into practice.

The training program opened up new avenues for recruiting qualified personnel and improved the skills of personnel already engaged in the rehabilitation profession as described in "Blindness 1965". Tremendous impetus was given to the establishment, expansion and improvement of rehabilitation facilities

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<sup>1/</sup> For full discussion, see article by Senator Randolph in "Blindness 1965".

which became an integral and essential part of the rehabilitation process. But even as the program moved vigorously ahead, it began to become apparent that the forces of change were again at work.

By the early 1960's, the special needs of workshops and rehabilitation centers, the special needs of the severely disabled, the new emphases and financing arrangements in the bold programs in education, welfare, and employment placed demands upon the vocational rehabilitation program which were beyond the scope of the existing law.

Thus started the process of writing a new chapter in the story of Federal rehabilitation legislation. The first step was the preparation by the Vocational Rehabilitation Administration of its suggestions for changes and improvements in the Vocational Rehabilitation Act. These recommendations were developed on the basis of experience gained in operating under the 1954 act. They took into account suggestions and consultation from all the major organizations and agencies engaged in the rehabilitation movement including the National Rehabilitation Association, the American Association of Workers for the Blind, the National Federation of the Blind, the National Association of Rehabilitation Centers, the National Association of Sheltered Workshops and Homebound Programs. Counsel was also sought from those who had been intimately involved in the training and research activities in vocational rehabilitation.

Forwarded to Congress in March, 1965

Based on the best advice available, the Vocational Rehabilitation Administration prepared a proposal for legislation which it felt would best meet the needs of the nation's disabled people. This proposal was then submitted to the Secretary of Health, Education, and Welfare who reviewed and modified it in the light of the objectives and requirements of other programs of the Department.

The revised proposal was then forwarded to the Bureau of the Budget where it was reviewed against the backdrop of our total national objectives and requirements. The resulting proposal was then forwarded to the Congress on March 12, 1965 with the recommendation that it be enacted as a part of the President's legislative program.

This legislative proposal contained several provisions designed to improve the vocational rehabilitation program. These were: (1) a new program with liberalized matching provisions to assist the States in determining the rehabilitation potential of severely handicapped persons; (2) a new program of direct grants for the construction of rehabilitation facilities and workshops; (3) a program of assistance to workshops, including workshop improvement grants, planning grants and technical assistance; (4) grants to assist in making long-range plans to meet the needs of disabled people; (5) changes in the requirements relating to the administrative location of the State rehabilitation agency so as to permit greater flexibility and to assure effective operation; (6) the establishment of a National Commission on Architectural Barriers to Rehabilitation of the Handicapped; (7) a program of grants to States and public and other non-profit organizations in planning, preparing for and initiating special programs to expand vocational rehabilitation services; (8) the establishment of a National Research and Information Service on matters relating to rehabilitation; (9) the removal of the economic needs test in the provision of reader services to the blind and interpreter services to the deaf; (10)



authorization of Federal matching for management services provided by the State agency in the vending stand program or in other small business programs conducted under the supervision of the State agency; and (11) several other technical and clarifying amendments to the existing law.

### Two Points of Variance in Bills

Bills embodying these legislative proposals were introduced by Senator Lister Hill on March 15 as S. 1525 and Mrs. Edith Green of Oregon on March 18 as H.R. 6476. Hearings were held in the House and in the Senate at which time interested individuals and organizations had an opportunity to give their views about needed changes in rehabilitation legislation. After deliberation by the House Committee on Education and Labor, a modified bill was prepared which was introduced by Congressman Dominick V. Daniels of New Jersey on May 20, 1965 as H.R. 8310.

This bill was passed by the House of Representatives on July 29. While there were relatively minor differences between H.R. 8310 as passed by the House and the Administration bill, there were two points of variance. One was the fact that the bill as passed by the House permitted the States to remove all services from a consideration of economic need. The other and far more important was in the method of financing proposed. H.R. 8310 provided for the same matching rate in all States (i.e., 75% Federal by FY 1967) for expenditures made for vocational rehabilitation services under the basic support program.

Under the administration proposal, the matching rate for grants for the support of rehabilitation services would have continued the variance according to the State's per capita income from 50% in the richer States to 70% in the poorer States. Also, in the area of financing, the allotment system proposed in the House bill would have allotted funds among the States from an annual authorization giving equal weight to population and per capita income, where the Administration proposal on the other hand would have allotted the sums appropriated each year on a formula which gave much greater weight to per capita income than to population, which means relatively larger allotments to the poorer States.

On the Senate side, the press of other important legislation prevented action on rehabilitation legislation until October 1, when S. 1525, which was the Administration proposal, was passed.

### Compromise Reached on Financing

The differences between the bills passed by the House and Senate would have to be resolved and agreement reached if there were to be new vocational rehabilitation legislation. It was clear that the basic bar to agreement would be the financing upon which there were deep and sincere philosophical differences. Negotiations and discussions to find financing provisions which would be acceptable to both Houses were carried on tirelessly by the conferees appointed by the House and Senate as the day of adjournment drew nearer and nearer.

Finally, when it seemed almost sure that time would run out, a compromise was reached which provided for the allotment of funds on the basis favored by

the Senate and for the matching of expenditures in accordance with the methods favored by the House. As soon as this basic compromise was reached, the other differences were quickly resolved and almost in the closing hours of the session, the Vocational Rehabilitation Act Amendments of 1965 were passed by the Senate and the House and sent to President Johnson who signed it into law on November 8, 1965.

The rush of last-minute action may have left a few points which could have been more precisely expressed. Some of these can be resolved through interpretation and clarification as the statute is administered. What is important is that the new law provides, for the first time, the opportunity and the wherewithal for an all-out attack on the problems of disability.

### Agencies Must Work Together

To agencies serving the blind it can mean the chance of providing vocational rehabilitation services by 1975 to all the blind people in this country who need and can benefit from these services.

It can mean this, however, only if the opportunity is steadfastly and imaginatively used. Public and private agencies must work together to supplement each other's program of service. They must work together in seeing to it that their needs and the needs of the people whom they will serve are incorporated into each State's long-range plans for vocational rehabilitation. If this is done, and a State commitment to provide the necessary resources is obtained, then the Federal financial support will follow and the right of blind people to have the help they need to lead full and useful lives will be recognized and fulfilled.

There follows a summary of the new law:

P.L. 89-333 covers a wide variety of new authorities. In many respects, the legislation is a process of filling gaps in previous law and meeting obvious unmet needs in rehabilitation programs across the country. Thus the new legislation must be taken in context with the basic legislative authority with which it existed before with respect to services, research, training, facilities.

### Financing the Federal-State Program

The new law changes the Federal financing provisions in the basic Federal-State vocational rehabilitation program under section 2 of the act. It specifies dollar limits or maximum authorization for allotment among the States — \$300 million for fiscal year 1966, \$350 million for fiscal year 1967, and \$400 million for fiscal year 1968. A State will have its funds matched at a rate of three Federal dollars for each State dollar available for fiscal years 1967 and 1968 up to the State's allotment. In fiscal 1966, the Federal share for a State is a percentage which is midway between its Federal share under previous law and 75 percent.

Appropriations are authorized only for these three years. For subsequent years, it will be necessary to ask Congress for further legislation to extend or revise this new financing system. These funds will continue to be allotted among the States on a formula which reflects a State's population and its per capita income squared (in relation to national population and income).



To assure that the increased Federal funds will not replace State funds but will be used to increase the total finances available, the law provides that the State funds in any State must be no less than they were in fiscal 1965 (and further that, should State funds be less, Federal funds will be reduced).

### Determination of Vocational Potential

The State rehabilitation agencies are authorized to provide vocational rehabilitation services to handicapped individuals to determine whether they can reasonably be expected to become able to engage in gainful employment.

Under previous law, State rehabilitation agencies were expected to determine, after diagnosis but before any rehabilitation services were rendered, whether or not a handicapped person could become employable after rehabilitation services. For large numbers of handicapped persons, with severe disabilities or complicated problems or both, this is virtually impossible. As a result, many of these handicapped individuals did not receive services.

Now a handicapped person can be provided services up to a maximum of six months to evaluate his employment potential. Within this period the State agency can observe his response to services and determine whether further services could be expected to result in employment. In the case of mentally retarded individuals (and any others designated by the Secretary of Health, Education, and Welfare) such services would be rendered to a maximum of 18 months.

### Grants to States for Innovation

The former program of "extension and improvement" grants to States is replaced by grants to States for two general purposes: (1) The development of methods or techniques which are new in the State for providing services, or (2) projects to serve those who have catastrophic or particularly severe disabilities. Federal funds for these grants are allotted on the basis of population.

For each State, the Federal share for the first three years of such a project is 90 percent for all States; for the remaining two years, it is 75 percent.

The act authorizes appropriations for these innovation grants of \$5 million for fiscal 1966; \$7 million for fiscal 1967; and \$9 million for fiscal 1968. Congressional action will be required to determine the amount of appropriations authorized for this grant program after 1968.

### Statewide Planning

Each State is encouraged to conduct statewide planning for rehabilitation during the fiscal years 1966 and 1967 (any funds appropriated for those two years which are not spent will remain available to complete the planning in 1968).

Federal grants covering 100 percent of the cost of such statewide planning are authorized, with the amount for any State not to exceed \$100,000 annually.

The planning activities are designed to accomplish three general objectives: (1) To bring into being a well-defined picture of State resources for rehabilita-

ting the disabled and a clear picture of foreseeable needs, (2) to help assure orderly growth and development and a minimum of duplication, and (3) to arrive at an organized statewide plan by which all disabled persons needing rehabilitation services can receive them by the year 1975. It is expected that this plan will be meshed with the facilities planning.

### "Expansion" Grants

Because the Administration and the Congress strongly wished to do everything possible to rehabilitate more disabled people as rapidly as possible, provisions are included in the new act for project grants to expand vocational rehabilitation services.

These grants are available to both State agencies and voluntary nonprofit agencies. However, the objective must be the rehabilitation and return to gainful employment of larger numbers of disabled individuals. Federal grants are available for paying part of these projects, the Federal share to vary according to the individual project.

### Flexibility in State Administration

Under the previous law, a State vocational rehabilitation agency had to be located either under the State Board of Vocational Education or organized as a separate agency or commission of State government.

Under the new act the agency may be a separate commission or agency. It may be located within the State unit administering or supervising the administration of educational or vocational education, or it may be part of a larger State organizational unit which includes two or more of the following State functions: education, health, welfare, or labor. The new law continues the authority for the administration of vocational rehabilitation programs for the blind by any agency of State government which is authorized by State law to carry out this function.

There is, however, a basic change relating to the organizational structure of the rehabilitation unit which is applicable to State agencies for the blind. Under this new provision, the State vocational rehabilitation agency must include a vocational rehabilitation bureau, division, or other organizational unit which (1) is primarily concerned with vocational rehabilitation, or vocational rehabilitation and other rehabilitation, of disabled individuals, and is responsible for the vocational rehabilitation program of such State agency; (2) has a full-time director; (3) has a staff employed on rehabilitation work on a substantially full-time basis; and (4) is located at an organizational level and has an organizational status within such State agency comparable to that of other major organizational units of such agency.

### Economic Need of Applicants

Previously, Federal law provided that certain services of the vocational rehabilitation program could be provided without cost only if the handicapped person was financially unable to pay the cost himself, within the State's requirements regarding the individual's economic need. The new law eliminates economic need as a prerequisite for vocational rehabilitation services, as far as the Federal Government is concerned. Each State, however, is at liberty to apply



such economic need tests as it wishes, or as may be required by State law. However, the State agency still has to take into account any similar benefits the individual may have by way of compensation, pension or insurance.

The Vocational Rehabilitation Administration is required to report to the Congress, by the end of the first year under this new law, what the effects of this change have been upon the policies and practices of the State rehabilitation agencies.

### Construction of New Facilities

For the first time, the act authorizes Federal funds to help construct new rehabilitation facilities and workshops.

This new grant program also assists in the acquisition of existing buildings, and the expansion, remodeling, alteration and renovation of rehabilitation facilities and workshops. Such projects also may include assistance with the costs of initial equipment and the acquisition of land.

The object here is to aid in expanding the number of rehabilitation centers, workshops and special rehabilitation facilities needed in the United States as a part of the total effort to develop adequate rehabilitation programs and services.

The law authorizes Federal appropriations of \$1.5 million for fiscal year 1966; \$7 million for fiscal year 1967; and \$9 million for fiscal year 1968. Since funds will be granted on a project basis, there is no statutory allotment system. The Federal share of such a project varies according to a formula, with a minimum of 33 1/3 percent and a maximum of 66 2/3 percent.

### Assistance with Initial Staffing

In connection with this construction effort, the new act authorizes Federal grant assistance in the costs of initial staffing of rehabilitation facilities and workshops, including not only those constructed through this grant program but other facilities and workshops constructed with other financing after the date of enactment of the new law.

Federal assistance with initial staffing is authorized at a maximum of 75 percent of staffing costs in the first year, 60 percent in the second year, 45 percent in the third year, and 30 percent in the fourth and final year.

A special provision of the act authorizes assistance in the construction of residential accommodations in connection with workshops for mentally retarded individuals and such other categories of handicapped individuals as the Secretary of Health, Education, and Welfare may designate.

To provide an orderly method of determining State needs and priorities in developing centers and workshops, the act authorizes grants to pay part of the cost of continuing statewide planning. This is expected to provide a pattern of review within each State which will minimize any overlapping in the developing of community and State resources, and will aid in reaching decisions on the best use of Federal, State and voluntary funds.

In further support of sound projects, the act authorizes planning grants, where needed, to aid project sponsors in developing well-conceived plans for construction of centers or workshops.

### Workshop Improvement

One of the major objectives of the 1965 act is to begin the expansion and improvement of sheltered workshops for the disabled throughout the United States. Present workshops, with their various purposes and disability groups, total around 800. Some experts have estimated that the nation needs 2,000 workshops. The new authority in the 1965 law for construction, previously described, is one of the basic approaches to this broad goal in workshop development.

The 1965 amendments authorize appropriations for the two grant programs for workshop improvement (training services projects, and improvement grants) as follows: For fiscal 1966 — \$1,500,000; for 1967 — \$9,000,000; and for 1968 — \$14,000,000. The act also provides that grants under the workshop improvement section may be made only if the workshop concerned meets the safety standards established by the Secretary of Labor.

### Plan for Workshop Improvement

The following provisions complete a plan to achieve a comprehensive program for workshop improvement in this country:

1. **Training Services Projects.** The act authorizes a five-year program (beginning July 1, 1966) of grants for projects to provide more and better job training for handicapped persons in workshops and rehabilitation facilities. Grants are authorized to States or to voluntary agencies. It is expected that grants will be made to State vocational rehabilitation agencies except in unusual circumstances. This new program authorizes grants for (a project, to be approved, must include) the following: (a) provision of training in job skills, work evaluation, work testing, tools, equipment, job tryout and related services; and (b) the payment of a training allowance to the handicapped trainee, at a rate up to \$25 per week plus \$10 for each dependent (but not exceeding \$65 per week per trainee). These training allowances for the handicapped in training in workshops or rehabilitation centers are limited to two years for each individual.

It is the responsibility of the State vocational rehabilitation agency to determine the suitability of the handicapped individual for such training and to determine that the training to be provided meets the individual's needs. For these training services projects, the Federal share is set in the new act at 90 per cent. To be eligible to participate in such a project, a workshop must meet the criteria adopted by the Secretary on the advice of the National Policy and Performance Council.

2. **Workshop Improvement Grants.** The new act recognizes the desire of many workshops to make improvements in their methods of operations, so they can provide the most modern and effective services to handicapped persons. The introduction of criteria as a result of the work of the National Policy and Performance Council undoubtedly will stimulate many other workshops to



seek improvements in their services and their general operating methods. Therefore, the new law authorizes workshop improvement grants during a five-year period beginning July 1, 1965. Improvement grants are designed to help workshops analyze, improve, and increase their professional services, to similarly elevate their business operations, and to generally make more efficient and effective the total operations of the workshop.

### Federal Share Varies

The act authorized Federal funds to pay part of the cost; thus, the Federal share of any project will vary from one situation to another.

3. Technical Assistance. One of the recurrent requests stated by workshop operators in many places is for the help of experts in business management, shop layout, professional services, sales management and the many other facets of a total workshop operation. The new act makes specific provision for this need. The Vocational Rehabilitation Administration can meet these requests through panels of experts in the various fields who can be placed on duty for short periods of time to advise and help the workshop in overcoming its specific problems. In some instances this will be done through contracts with the State rehabilitation agency. This technical assistance is furnished without charge to the workshop.

4. National Policy and Performance Council. In making grant funds available to State agencies and workshops for training services projects, it is necessary to have available certain criteria which reflect the general capacity of a workshop to provide the training services needed. Therefore, the act calls for the establishment of a National Policy and Performance Council, composed of 12 members selected from the fields of vocational rehabilitation, workshops, State or local government, business, the professions, labor and the general public.

The Secretary of Health, Education, and Welfare appoints the members and chooses a chairman from among the membership. Each member serves a term of four years, except that initial appointments will be made for lesser periods, to begin a system of automatic rotation of council membership. The council is responsible for advising the Secretary on the policies and criteria to be used in making grants for training services projects; for making recommendations on workshop improvement generally and for assessing the effectiveness of the workshop improvement section of the act; and providing such other advice and services as the Secretary may request.

### Local Public Funds

The new law encourages local jurisdictions (counties and cities) to make local funds available for increasing vocational rehabilitation services to their disabled citizens. Such local funds, made a part of the funds of the State agency and its program, can be matched with Federal funds at the same rate that other State funds are matched. For the purpose of this new matching procedure, the "Statewideness" requirements of the Federal law and State plan may be waived.

### Commission on Architectural Barriers

This provision of the new act establishes in the Department of Health, Education, and Welfare a National Commission on Architectural Barriers to



Rehabilitation of the Handicapped, consisting of the Secretary or his designee as chairman, and not more than 15 members. These members are chosen from among the general public and from private and professional groups working with, and having knowledge of architectural problems and their solution.

This commission functions in an effort to capitalize on the extensive and successful work done in recent years by many public and voluntary groups, aimed at making buildings more accessible to, and more usable by, seriously handicapped people. It aims to overcome the barriers faced by disabled people in wheelchairs, those on crutches and braces, the blind, those with severe cardiac conditions, and others who are prevented from working and leading a normal community life by these obstacles.

The commission will function for three years, with an annual appropriation of \$250,000 for its expenses. A final report is to be furnished prior to January 1, 1968.

#### Research and Information

To further complement the 11-year-old research grant program of the Vocational Rehabilitation Administration, a new program of intramural research activities is authorized. This will permit the Vocational Rehabilitation Administration to undertake certain research and developmental activities which can be carried out more expeditiously through direct activity than by grants.

A national data system in rehabilitation also is to be established under the new law. This is to be a national service function for rehabilitation agencies and institutions, scientific and professional organizations, and other elements of the total rehabilitation effort in the United States. Following the necessary organizational and systems development, computers will be used to store, analyze, retrieve and disseminate scientific, program, industry and a variety of other data needed by rehabilitation workers.

#### Raising of Limitations on Training

This amends Section 4(a) and Section 7(a)(3) to authorize a maximum period of four years of Federal financial assistance to any individual pursuing a course of professional study in rehabilitation. The previous law limited this assistance to two years (except that three years are authorized for physicians in training in physical medicine and rehabilitation). It also lists examples of the professional disciplines included in training and traineeships supported.

#### Federal Matching for Management Services in Vending Stands and Other Small Businesses

The new act authorizes (effective July 1, 1966) Federal matching for management services provided by State vocational rehabilitation agencies to vending stands and other small businesses established under the supervision of the State agency.

#### Reader Services for the Blind and Interpreter Services for the Deaf

The new act authorizes Federal matching in expenditures made for providing reader services for the blind and interpreter services for the deaf without regard to the client's economic need or his eligibility for similar benefits from other sources.

# THE DEAF-BLIND PERSON: A REVIEW OF THE LITERATURE

*By Peter J. Salmon and Herbert Rusalem\**

## The Scope of the Problem

There has been a tendency to confuse individuals who are hard of hearing and blind with those who are deaf-blind. In an attempt to formalize the distinction between the two groups and to establish a standard for service and research purposes, the Industrial Home for the Blind (1958) suggested the following parameters for deaf-blindness:

"For purposes of this study, the term 'deaf' has been defined to mean inability to understand connected discourse through the ear. The definition of blindness is the generally accepted 'legal' definition of central visual acuity of 20/200 or less in the better eye with correcting glasses or central visual acuity of more than 20/200 if there is a field defect in which the peripheral field has been contracted to such an extent that the widest diameter of visual field subtends an angular distance no greater than 20 degrees."

The National Study Committee on the Education of Deaf-Blind Children, although less precise in setting measurement limits, provided a definition in terms of educational functions (Burns and Stenquist 1960):

"A deaf-blind child is one whose combination of handicaps prevents him from profiting satisfactorily from educational programs provided for the blind child or the deaf child."

The IHB definition was developed with deaf-blind adults in mind and may have special value for that group while the definition suggested by The National Study Commission was designed primarily for children and may be most applicable to that group.

Case-finding problems, confusion concerning definition, the lack of adequate survey methods, and general apathy toward the group have all contributed to the unreliability of demographic data concerning deaf-blind persons. Thus, estimates of the incidence of deaf-blindness tend to be relatively gross. It has been conservatively estimated (Industrial Home for the Blind 1958) that there are three thousand deaf-blind adults in the United States.

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\* The authors wish to express their thanks to Joanne Smith for her assistance in developing this paper.



Despite an extensive literature, relatively little is known about the characteristics of deaf-blind adults as a population. The most comprehensive data appeared in a report prepared by Parnicky and Onken (1959) which reviewed the characteristics of 180 deaf-blind adults residing in New York State. Fifty-four per cent of the group were males. The median age was 54 years for both men and women. Visual acuity ranged from usable vision to total blindness with the male group having slightly more vision than the female group. All of the members of the sample were functionally deaf.

About half of the group became deaf-blind prior to age 35. Some 30 per cent of them had additional physical and/or psychological disabilities. Half of them had achieved a seventh grade education or better. Some 30 per cent of them had attended high school. Almost half had no speech; about one-third had understandable speech. The manual alphabet was used in communication by about 50 per cent of them. Slightly less used Braille. About 60 per cent of them were capable of traveling outside their immediate neighborhoods. Two-thirds lived in the community; one-third lived in hospitals or specialized residences. Thirty-eight per cent were employed, primarily in sheltered workshops.

From these data, Parnicky and Onken arrived at the following generalizations:

1. The actual characteristics of deaf-blind persons show them to be less limited than usually supposed.
2. Many deaf-blind persons have potentialities that can be developed in a rehabilitation program.
3. There is a need for expansion in services to this group.

### Few Complications More Baffling

Attempts have been made to describe the effects of deaf-blindness upon an individual. These have ranged from highly fanciful suppositions about the minimal effects of the double disability upon certain outstanding deaf-blind persons to the more numerous pessimistic appraisals which stress the incapacities of those with this complex disability. Rather than referring to ephemeral and questionable descriptions of the impact of deaf-blindness upon the individual, this article will report the item in the literature which, more than any other, seems to summarize the problems of deaf-blindness with unusual clarity. Thus, Waterhouse (1957) has written as follows:

"There can be few complications more baffling than the combination of deafness with blindness. Deaf people who can see find that they can substitute sight for hearing in many effective ways — lip reading, for example, and observation of facial expressions. Blind people who can hear pay unusually effective attention to the sounds around them, and many use effectively in travel the so-called "facial vision" which seems to be entirely dependent on hearing. By means like these, a goodly number of the deaf and the blind live amazingly normal lives.

"When both sight and hearing are impaired, so that substitutions of one for the other are impossible, both handicaps are rendered more



profound. The sense of touch, which is the most valuable one remaining, can often with intensive training become an adequate channel of communication but is clearly of too short a range to help very much in travel. Thus, the two greatest handicaps resulting separately from deafness and blindness—namely communication and travel, are increasing in intensity."

The Waterhouse formulation quoted above reflects the physical losses associated with deaf-blindness. Yet, the psychosocial implications of the double disability can be as significant as the physical losses. Rusalem (1966) has suggested the role of human contact as a factor intensifying the effects of deaf-blindness.

"If the dimensions of deaf-blindness were confined only to the visual and hearing loss, the individual's history of experience deprivation and the effects of a debilitating struggle to retain emotional integrity, the rehabilitation problem would still be unbelievably difficult. Yet, there is still another deprivation which superimposes itself upon all the others. From the moment that the deaf-blind individual encounters the first thrust of the double sensory disability, his need for human contact, warmth and support becomes critical. Behavioral scientists have learned that extreme privation is blunted in its impact upon the individual when it occurs in the framework of an accepting human relationship. Provided with a continuing satisfying contact with another person, the human organism can endure surprising extremes of suffering and deprivation.

"At the time that he needs such relationships the most, the deaf-blind person has the least possibility of sustaining or developing them. His communication with others may be so markedly impaired by the double sensory limitation that free and easy communication may be all but impossible. His own emotional response to the difficulties of accepting and coping with his deaf-blindness may result in behaviors that make warm human relationships more difficult to attain. But, most important of all, just as deaf-blindness builds a communication wall between the individual and his world, so do the attitudes of sighted persons. The barrier they build is a social interaction wall of indifference, apathy and neglect between themselves and the deaf-blind person. In many respects, this is the most impenetrable wall of all."

The consensus in the literature is that deaf-blindness is one of the most limiting of all human disabilities. Interesting enough, the fact that a few selected individuals have overcome the most marked effects of the handicap to achieve distinction, has not modified this perception to any great degree. On the contrary, deaf-blind persons as gifted as Helen Keller, while creating wonder and admiration regarding themselves, have not changed substantially the public view of deaf-blindness in general as a hopeless condition incapacitating the individual in almost all spheres of personal living. Thus, Helen Keller was placed on a pedestal that set her apart from other deaf-blind individuals. Yet, mounting historical evidence is finally being combined with anecdotal and experimental evidence to suggest to many people that emphasis has been placed far too long upon incapacity and hopelessness and that the time is ripe for a new stress upon potentiality.

## General Description of the Literature

The literature concerning deaf-blindness faithfully reflects current conditions in this area of service. Systematic, scientific studies are few in number and often imperfect in design. Exclusive reliance upon the relatively few available professional sources would yield a fragmentary picture of deaf-blindness. Indeed, many of the professional investigations undertaken focus upon minutiae that are less relevant to an understanding of the deaf-blind person than the organismic picture presented in less scientific writings. As a result, this paper necessarily concerns highly personalized materials, colored by personal bias, but rich in the depth of their involvement with deaf-blind persons. In brief, most of the publications about deaf-blind persons were written by individuals who were emotionally and personally concerned with this double handicap. Although such materials lack objectivity and adequate controls, they have the advantage of being colorful, vivid, and moving.

The literature of deaf-blindness is characterized by this human quality. Even when scientists become interested in the field, there is a tendency for detachment to depart and for warm human feelings to dominate. With few exceptions, those who have written about deaf-blind persons have been moved to do so by reason of their profound feelings about this group. Consequently, personalization fills the literature, most often in terms of personal experience with deaf-blind individuals or biographies of them. For example, when educators begin to study teaching methods used with deaf-blind children here and abroad, they find it difficult to confine themselves to educational theory and method. Frequently, objective considerations become overshadowed by the educator's appreciation of the courage and abilities of the deaf-blind child and the impossibility of separating himself from his feelings about them. Consequently, this literature is a depository of compassion, warmth and humanity not ordinarily found in education and rehabilitation.

Apparently, those who write about deaf-blindness are those who most clearly sense the human struggle involved in overcoming the effects of deafness and blindness. This struggle is so often full of drama that the more pedestrian concerns of method, approach and atomistic research seem less important. As a consequence, the literature of deaf-blindness and this review of it are mirrors of feelings rather than cold analysis. This emphasis on the interpersonal theme recurs in publications about deaf-blindness from Diderot (1713-1784) to the most current writings. This flavor comes through in many materials, e.g., the preface prepared by Mary E. Switzer for "The Rehabilitation of Deaf-Blind Persons: A Manual for Professional Workers" (Industrial Home for the Blind 1958):

"The preliminary steps to understanding, so far as the deaf-blind person is concerned, are the building of confidence and trust in the friendliness of the rehabilitation worker, of assurance that someone is interested in him as an individual. Thus, the first handclasp and the first word are more than greetings. They are the first links in the rehabilitation process. By their very warmth, they can light the glow of hope that is essential to every successful rehabilitation but so very vital to the rehabilitation of those persons who neither see nor hear, and who must concentrate practically all of their attempts to communicate on their sense of touch."



The characteristic personalization of the literature on deaf-blindness does not necessarily make these writings invalid. On the contrary, their sincerity, clarity of observation, and personal revelation present a totality of response that is relatively rare in current scientific writing. These authors are concerned with a total organism, in most cases, and not with segments of his anatomy or psyche. However, in reporting such materials, this review urges caution upon the reader. Since most of the writers concerned had an emotional involvement with their subjects and since experimental verification is lacking in many instances, the global impressions are likely to have greater validity than the theories or causes presented. Thus, all the scientific evidence that we have been able to gather confirms the fact that deaf-blind children can be educated and that deaf-blind adults can be rehabilitated. However, little evidence supports specific educational and rehabilitation techniques.

This review will draw more heavily upon the numerous personal documents rather than upon the few scholarly studies. There have been other attempts to draw together the literature on deaf-blindness (Farrell 1956, IHB 1958, Burns and Stenquist 1960) which provide invaluable data about past and present efforts to assist deaf-blind persons. These overviews suggest that individual concern for deaf-blind persons goes back many centuries. However, organized provisions for deaf-blind persons are relatively recent. The earlier history of service to deaf-blind persons is marked by heroic figures whose individual sensitivity to deaf-blind persons ran counter to the existing apathy and neglect which permeated their societies. As a result, the historical threads of service to deaf-blind persons is rather a history of biography than of broad social movements.

Furthermore, it is more clearly a history of concern with deaf-blind children than with deaf-blind adults. In any event, the story of deaf-blindness spotlights a few atypical individuals who broke away from the conventions of their time to work with promising deaf-blind persons. In time, a few notable deaf-blind persons also became major threads in the developmental process. In recent years, greater maturity is emerging as outstanding personalities are being joined by agencies, institutions and larger segments of society in creating the modern history of service to deaf-blind persons. For example, the Vocational Rehabilitation Administration,\* The American Foundation for the Blind, and others have taken laudable leadership in promoting programs for deaf-blind persons in concert with a growing number of schools and community agencies.

## General History

Farrell (1956), in his excellent review of the education of deaf-blind children, reported that Dr. John Bulwer, an English educator, was responsible for the first reference to deaf-blindness in print in 1648. Even at that early date, Bulwer felt that deaf and blind persons could be taught to speak. Farrell also reported that Deschamps in 1779 and Panduro in 1795 expressed belief in the educability of the deaf-blind. Diderot (English translation 1916) published his "Letter on the Blind" in 1749,\*\* in which it was indicated that the sense of touch could be used to establish a connection between words and tangible objects.

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\* See projects 96,315 and 1004, VRA grants, BLINDNESS 1964 and 1965.

\*\* Reprinted in this Annual.



Services to deaf-blind persons in America had their beginnings at the Perkins School for the Blind in Boston. In 1837, Samuel Gridley Howe, then head of the Perkins School, developed an educational program for Laura Bridgman, a deaf-blind girl from New Hampshire.

The Perkins experience with Laura Bridgman attracted national, even international attention. Anagnos (1882) in a historical sketch of the education of the blind, noted that Laura Bridgman was taught the names of objects through setting metal type and teaching her the manual alphabet. Subsequently, she was taught words expressing positive qualities, then prepositions, and then verbs. At age 10, she was reported to have had a vocabulary equivalent to that of a three-year old. In time, her pleasant personality and improved skills made it possible for her to communicate with a widening circle of people. Laura Bridgman's educational experience did not result in complete self-care and independence but nevertheless constituted an historical breakthrough that paved the way for later educational and rehabilitation developments.

#### Next Milestone Educational One

Charles Dickens (1921) paid a visit to Perkins during an American trip in 1842 and had an opportunity to observe Laura Bridgman. He described her as having an insatiable thirst for knowledge and quick perceptions of the relationships of things. He noted that Laura was serving as an apprentice, assisting in the education of Oliver Caswell, another deaf-blind student attending Perkins. Greatly impressed with Laura, Dickens expressed the feeling that sighted and hearing persons could learn to comprehend the world more fully through studying the activities of deaf-blind individuals. The education of Laura Bridgman attracted the interest of a number of educators. For example, Farrar (1937) reported that Dr. Francis Lieber, an educator and political scientist who taught at the Columbia University Law School, showed special interest in her vocal sounds. He seems to have concluded that there are similarities between deaf-blind persons and individuals living in other cultures.

In the ensuing years, other deaf-blind students received educational services although organized assistance to deaf-blind adults lagged. As may be expected, the next milestone was an educational one. In 1887, Anne Sullivan met Helen Keller, her deaf-blind student, for the first time. This encounter influenced services to deaf-blind persons in a profound manner. Described graphically in Helen Keller's autobiographical writings (Keller 1904, 1929, 1938) and in numerous other books and magazine articles, this relationship between teacher and student commanded international attention.

The story has been told many times in publications, the theatre and the films, but it still retains excitement and freshness for each succeeding generation. From the point of view of this survey, the historical importance of the Keller-Sullivan team was not only of unprecedented educational accomplishment in school and college but the fact that this education was used with conspicuous success in the adult world of practical reality. This constituted an irrefutable demonstration of the capacities and potentialities of deaf-blind persons, a demonstration that continues to stir the hearts and minds of men many generations later.

As the life story of Helen Keller became part of the American story and, less spectacularly but equally important, as evidence began to accumulate that

deaf-blind children could be educated, other schools for the blind (Overbrook, Virginia, Indiana, Minnesota, Michigan and Washington) began to serve deaf-blind students. Simultaneously, services for deaf-blind adults continued their moribund status.

### Beginning In World War I Period

Decades after the education of Helen Keller, service to deaf-blind adults continued to function on an informal basis. Occasionally, individual cases were reported by schools and agencies for the blind, but these represented isolated exceptions to the general rule of neglect. Finally, a beginning was noted in the World War I period. Writing of this development, Salmon (1958) stated:

"Almost immediately after joining the staff of The Industrial Home for the Blind in 1917, I had the opportunity to introduce to service first one, then two or three additional deaf-blind men and was deeply gratified to find, with the simple use of the manual alphabet and an understanding of the problems that confronted them in communicating and in being understood, how eagerly, quickly and adequately it was possible for them to fit into the program designed for the blind."

Thus, long after the first foundations had been laid for the education of deaf-blind children, the first stirrings were observed in services to deaf-blind adults. In this connection, as well as in educational matters, the Perkins School for the Blind made a significant contribution. The spark which ignited Salmon's interest and, consequently, the interest of the IHB and other agencies for the blind in deaf-blindness was struck at the Perkins School. Salmon's observations of the Perkins School program for deaf-blind children and the dedicated teachers who manned that program "led, almost from the beginning, to a desire on my part to add what little I could to bringing to them a fuller and richer life."

The field of the education of deaf-blind children continued to make dramatic advances during the fourth and fifth decades of the Twentieth Century. In 1931, under the leadership of Dr. Gabriel Farrell, the Perkins School organized a special Department for Deaf-Blind Children. This development, a major milestone in the field, stimulated the formalization of services for the deaf-blind at other schools. Soon, thereafter, a teacher-training program was organized at Perkins. In the beginning, the emphasis was upon re-training teachers of the deaf to work with deaf-blind students. Subsequently, educators with other backgrounds were enrolled in the program. Concurrently, the enrollment of deaf-blind children rose steadily.

### Program Given New Impetus

During World War II and immediately thereafter, the program for deaf-blind pupils was curtailed. When Dr. Edward P. Waterhouse assumed leadership at Perkins, the program was given a new impetus in three directions: educating deaf-blind children, training teachers and conducting research. Burns and Stenquist (1960), in their comprehensive review of deaf-blindness in the United States with departments for deaf-blind children, enrolling a total of 42 pupils.

By 1960, eight schools were enrolling a total of 87 deaf-blind pupils; 29 at the Perkins School for the Blind, 15 at the Alabama Institute for the Deaf and Blind, 12 at the New York Institute for the Education of the Blind, eight at the



California State School for the Blind, eight at the Illinois Braille and Sightsaving School for the Blind, seven at the Michigan School for the Blind, six at the Washington State School for the Blind, and two at the Iowa State School for the Deaf. During the same year, the Perkins Program employed a staff of 37 adults. At that time, recent innovations included the development of a program through which deaf-blind and blind children resided in the same cottages, thus enabling the deaf-blind to have richer interpersonal experiences. In 1960, Perkins established a readiness program which included socialization, self-care, motor functioning, self-occupation, intellectual functioning (including development of auditory, visual, tactual and olfactory perception), language building, creative experience and communication.

In the 1960's, progress in the education of deaf-blind children accelerated. Some of the current included: spread of teacher-training to other schools for the blind, integration of deaf-blind and blind students in certain activities, improved diagnostic procedures, earlier case-finding, more extensive pre-school training, better parent counseling, use of such methods as vibrations and motor-kinesthetic speech, and better coordination with programs for the deaf-blind adult, especially for students in the teen-age group. Though the deaf-blind graduates emerging from the current school programs receive less public attention than did Helen Keller, they tend to be relatively well-educated as a result of the training provided to them, they are better equipped than earlier generations of deaf-blind students to assume community and family responsibilities and lead happy and useful lives.

Concern for deaf-blind children has not been confined to the schools for the blind. After years of less formal service to deaf-blind persons and those serving them, The American Foundation for the Blind in 1946 organized a Department of Service to Deaf-Blind persons under the leadership of Helen Keller. The staff person was Mrs. Dorothy Bryan. This department has had a twenty-year history of contributions to the education and rehabilitation of deaf-blind persons through maintaining essential population statistics; encouraging the development and expansion of programs; providing consultation to individuals, families, schools and agencies; awarding scholarships, contributing to the literature of deaf-blindness, conducting conferences and supporting research efforts.

The American Foundation for the Blind also played a part in stimulating teacher-training. For example, along with the Perkins School, it sponsored an experimental teacher-training program in 1949, 1950 and 1951, and in cooperation with the National Study Committee on the Education of Deaf-Blind children, it sponsored a teachers' workshop in Hartford, Conn., in 1951.

### Third Major Strand by IHB and Co-Author

In another vital development, the American Foundation for the Blind assisted in the establishment of a diagnostic clinic for multiply disabled blind children at Syracuse University in 1957. This work was extended through a workshop on pre-school blind children conducted at Syracuse the following year. The foundation program has not confined itself solely to educational matters. Its continuing concern for the deaf-blind adult was manifested in its sponsorship of a four-day workshop in 1956 on the vocational training employment of deaf-blind persons. Since then, it has maintained a consistent interest in rehabilitation programs for adults, cooperating with such agencies as The Industrial Home for the Blind in demonstration and research programs. The



Perkins School for the Blind also has developed an evaluation team that has made substantial contributions to the diagnosis and treatment of deaf-blind children.

The third major strand in the history of services to the deaf-blind was contributed by The Industrial Home for the Blind and Peter J. Salmon, its administrative vice-president. As early as 1940, this organization began to collect data on about 15 deaf-blind men then functioning in the IHB Workshops. These observations and subsequent experiences resulted in the establishment of a department for the deaf-blind at IHB, which was formalized on Helen Keller's 65th birthday, June 27, 1945 — the first and to this date the only organized program of its kind in the United States. The new department, developed with the advice and participation of Helen Keller, launched an accelerated and strengthened service program for deaf-blind adults.

During the next decade, as the caseload of deaf-blind clients at the IHB grew, the quality of services rose accordingly. In 1956, with the cooperation and support of the Vocational Rehabilitation Administration, the IHB initiated a study of the characteristics and problems of deaf-blind persons. Completed in 1958, this study (Industrial Home for the Blind 1958), reported in seven volumes one of the first comprehensive surveys of the rehabilitation potential and status of deaf-blind adults. Although the study produced extensive technical data, the following general findings reflect its essence:

1. Communication is the basic problem in serving deaf-blind persons.
2. There is need for more medical research.
3. Imaginative adaptations of existing psychological instruments and techniques now make it possible to test the deaf-blind client.
4. Many deaf-blind persons can become self-supporting, especially in a workshop setting.
5. Recreation is an essential service to the deaf-blind.
6. An enlightened and interested administration is the starting point of a service to deaf-blind persons.
7. Regional rehabilitation services for deaf-blind persons should be established in all sections of the United States.

#### IHB Expanded Scope To Women

A companion volume (the eighth in the series) was devoted to materials relating to the Committee on Services for the Deaf-Blind of the World Council for the Welfare of the Blind. After 1958, several important developments occurred. In a series of meetings (almost annually at the American Association of Workers for the Blind and at occasional international conferences, such as the World Council for the Welfare of the Blind (1959), the findings of the IHB Study were disseminated to professional and lay persons. Furthermore, individual deaf-blind persons began to find their way in increasing numbers into established programs for blind persons, confirming the IHB position that, with specified

types of consultation and staff training, most agencies for the blind could accommodate deaf-blind persons. Simultaneously, the IHB, which had limited its service to blind men, expanded its scope to include deaf-blind women and created special services designed to enhance the hearing effectiveness of blind persons with aural problems.

In the years subsequent to 1958, the IHB and the VRA had encouraged agencies in other sections of America to establish regional rehabilitation services for deaf-blind persons. Preliminary plans for such services were developed by two agencies, one in the Midwest and one on the Pacific Coast. In both instances, however, conditions did not warrant actual implementation of the original plans. Consequently, when 1962 dawned, the IHB remained the only agency for the blind in the United States with a formally organized service for deaf-blind adults. When it became clear that, over the short run, it was unlikely that any other agency would take the lead, the IHB applied for and was granted project funds for a regional rehabilitation service for deaf-blind persons. This project is currently in progress.

Thus, from the point of view of organized service, many schools and agencies have played roles in the evolution of educational and rehabilitation services for deaf-blind persons. Leadership has been exercised primarily by the American Foundation for the Blind, the Perkins School for the Blind and The Industrial Home for the Blind. However, in each instance, support and encouragement was provided by other organizations, e.g. the Vocational Rehabilitation Administration, various colleges and universities, residential and day schools, community agencies, lay groups and professional organizations such as the American Association of Workers for the Blind and the American Association of Instructors of the Blind.

Although a few schools and agencies have taken leadership in the evolutionary process, deaf-blind persons themselves have made a major contribution. Frequently, the achievements of such persons have dramatized the cause, thereby mobilizing community interest. In this respect, of course, Helen Keller and Laura Bridgman were pre-eminent. Yet, a history of deaf-blindness would be incomplete without taking note of other deaf-blind persons whose accomplishments provided added impetus to the emergence of expanded services.

### Distinguished Deaf-Blind Persons

Although case reports of deaf-blind persons have appeared in the literature for hundreds of years, the most influential ones in fashioning current attitudes toward deaf-blind individuals were those of the Nineteenth and Twentieth Centuries. These individuals had a profound impact upon some professional and lay persons, stimulating them to take positive steps toward improving conditions for deaf-blind persons. Although it would be impossible to describe all of these deaf-blind persons in this paper, some details concerning a selected few of the earlier ones will be presented along with accounts of some of our own contemporaries.

The American Annals of Education and Instruction united with the American Journal of Education (1831) reported the story of Julia Brace who was born deaf in 1807 in Hartford, Conn., and who, as a result of typhus fever, became blind at the age of four. Immediately after the onset of the double disability, Julia Brace thought of herself as living through a "long night" and seemed unaware of her disability. As consciousness of her condition dawned, she began to perceive deaf-blindness as a punishment inflicted upon her by those around her and, as a consequence, between the first and second year subsequent to her illness, she



was irritable, full of passion and given to profanity. As she became calmer, her mother attempted to train her. At age 9, she learned to sew and, then, to knit. Since the family containing seven children was often in economic distress, the mother was compelled to work. At such times, Julia cared for the other children, apparently being sensitive to their whereabouts and activities. At age 25, she was reported to be a resident of the American Asylum for the Deaf. Although she had acquired some signs as a means of communication, her isolation remained largely intact.

Fuller (1879) reported on the experiences of Sophia Augusta Hutson who apparently was born deaf-blind in Wilkes-Barre, Penn., in 1859. The first effort to teach her language was made by a clergyman when she was 16 years of age through the medium of the "knuckle (or Indian) alphabet" in connection with raised letters. When the clergyman-teacher left for a missionary assignment in Brazil, Fuller undertook the instructional responsibility, using the manual alphabet as the major communication device. After Sophia learned many words and the objects which they represented, an attempt was made to introduce her to concepts. Gradually, she also mastered self-care, knitting, sewing, crocheting and housekeeping. In time, she learned to write her name and the meaning of the Lord's Prayer. Unfortunately, instruction was terminated by reason of Fuller's own blindness and feeble physical condition.

Havstad (1891) described Ragnhild Kaata, a Norwegian child who had scarlet fever at age 3 1/2 and as a consequence was deprived of her sight and hearing. Although she lost her acquired speech within a brief period of time after her illness, she learned to knit and to help with the other children in the family of which she was the oldest child. When she was 13 years of age, additional instructional possibilities for her were considered but neither the schools for the deaf nor the blind in her country would accept her. As a result of a letter written to the newspapers about her condition by a teacher in her home town, the sum of \$2,000 was publicly raised on her behalf.

At age 14, Ragnhild finally was admitted to the Hamar School for the Deaf where she was instructed through the oral method. In three months, she had learned most consonants and vowels and had mastered a few words. In time, words became associated with objects. Once this had occurred, she insisted upon being informed about the names of everything in her experience. In six months, she was able to learn new words readily and was using a typewriter designed especially for her that produced raised letters. It was noted that her speech was more intelligible than that of many other deaf persons. Most of this instruction occurred through the use of raised pasteboard letters rather than the manual alphabet. In 1894, continued progress was reported. At that time, through the use of touch, she had become a proficient lip-reader with good speech. As a final note, it was indicated that some of her textiles had won a medal at the Skien Industrial Exhibition in 1891.

Merrick (1922) reported on the case of Harld Thilander who was born in Sweden in 1877 and lost both sight and hearing as a result of an attack of scarlet fever at age 7. Two years later, he was placed in a school and home for the disabled in Stockholm where, using his slight residual hearing and Braille, he engaged in a variety of intellectual abilities, including translating books into Braille, acquiring much learning and corresponding with people in many different countries. One of his major projects was that of espousing the adoption of an international language, preferably Esperanto, by blind persons. At age 32,



he was employed by the Swedish National Library for the Blind. Subsequently, he became editor of the Swedish weekly Braille magazine and set up his own Braille printing press. At age 35, he assumed the editorship of *Esperanto Ligiolo*. Although this work was interrupted by World War I, it was subsequently reactivated.

During the first part of the Twentieth Century, occasional reports appeared concerning educational experiences of deaf-blind children in various educational institutions, (e.g. Robin 1901, Perkins School for the Blind 1904, Jones 1906 and Hayes 1926.) Owing to the fact that follow-up data relating to community adjustment were not emphasized in these reports, they will not be presented in detail in this paper. Typical of this genre is Illingworth's (1910) report of the case of David Brown McLeon who was born in Scotland in 1892. Deaf-blindness had an early onset and by the time he was six years of age, he was totally deaf and totally blind. He retained some whispered speech which he used when he was enrolled at the Royal Blind Asylum and School in addition to perceiving a communicator's head movements indicating "yes" and "no." A bright boy with hearing was assigned to work with David, and with one hand on the teacher's larynx and the other on his fellow-student's lips, David began to learn words. This instruction was accompanied by lessons on the manual alphabet and Braille. After one year of instruction, he achieved good communication and social adjustment. At last report, he was a capable gymnast who was proficient, as well, in Braille, typing, arithmetic and sewing.

#### Initial Communication Via Pen Knife

In 1907, Courson reported on Marie Heurtin to whom she referred as "Helen Keller's French sister." Attempts by the family to place this congenitally deaf-blind child in a home or an asylum did not succeed. In desperation, the parents brought Marie to the nuns at Larney, near Poitiers, who were reputed to have educated one deaf-blind child. The nun who had been most active in the education of this earlier deaf-blind child had died one year prior to the arrival of Marie at the convent. Consequently, the educational task fell to Sister Ste. Marguerite who had observed the methods of teaching deaf-blind children which had been used earlier at the convent.

During her first two months there, Marie did nothing but scream, shriek and roll on the floor. Initial communication was established through the medium of a pen-knife which was one of the child's prized possessions. Sister Ste. Marguerite took the knife away, showed Marie the sign for knife, and returned it only when Marie made the correct sign. Gradually, other words were taught, and eventually Braille instruction was introduced. In time, abstract concepts were acquired including those of poverty and richness, time, life, death, love, God and right and wrong. Although she never acquired the educational status of Helen Keller, Marie learned to write and to do housework. She spent the rest of her life at the convent where it was believed that the greatest achievement of her teachers was that of reaching her soul.

Everett (1902) discussed the achievements of a number of deaf-blind persons. Among these were: Morrison Healy, poet and author; Madeline Wallace who, after being educated at the New York Institute for the Education of the Blind, entered a convent; Jane Patterson, an English deaf-blind person who, along with reading the classics, kept house, took care of money and performed shopping duties; Katie McGirr who lost her sight at age 8 during the famous

blizzard of 1888 and who was able to read seven different systems of raised type; Orris Benson who performed fine carpentry; Tom Stringer who, characterized as a "mechanical genius," invented his own elevator; Linnie Hague-wood who heard and recognized music through touch; and Leslie Oren who, at age 8, had a vocabulary of 600 words, read a menu, and was able to read and write Braille proficiently. During the World Conference on Work for the Blind (1931), the conferees were told about Helen Schultz, a deaf-blind girl who was educated both at home and for a period of ten years by teachers of public school classes in Jersey City, Montclair, and Newark, N.J.

### Too Old To Attend Perkins

Stephen Cartwright (1937) constituted a somewhat different type of case. Born in Centerville, Penn., in 1898, he was orphaned early in life. At age 12, he was compelled to work 12 hours a day, six days a week in a chain factory. Despite economic handicaps, he was graduated from high school and entered Carnegie Tech where he trained as an engineer. In his senior year, his education was interrupted by the Mexican troubles. He enlisted for border service and was later sent to the Philippines. The outbreak of World War I extended his absence from college. At age 19, he achieved the rank of Second Lieutenant and subsequently took part in the Siberia campaign where he received but recovered from serious head injuries. Finally, in 1920, he was demobilized and after completing his engineering degree, he obtained a good job. Subsequently, he suffered a cerebral hemorrhage which left him deaf and blind. While still in the hospital, he received the help of a social worker and began to communicate with others using print-in-the-palm, and later the Morse Code and Braille.

Since Cartwright was too old to attend Perkins, the social worker took private lessons in speech reading and taught the technique to him. After leaving the hospital he acquired experience in lecturing and in being interviewed on radio. These activities stimulated him to consider a career as a commentator on world affairs. After spending some time in Europe, he returned to the United States, was auditioned for a radio job, and was hired. Subsequently, he was married and seemed on his way toward developing a satisfying career.

Kling (1928) described the case of Helen Martin who became deaf-blind one week after birth as a result of a septic infection. At age seven, stimulated to undertake this activity by the playing of her sister and her cousins, she began to learn to play the piano. Enrolled in the Kansas State School for the Deaf, she completed the sophomore year in high school. At school, a blind piano tuner encouraged her to consider a professional career in music. In 1923, after a period of musical study, Helen made her debut in a church at Olathe, Kansas. Her performance captured the interest of a local music critic whose newspaper story about the recital was widely read. Subsequently, Helen received numerous invitations to play before audiences. Later, in response to a scholarship offer, she studied for half a year at the Wichita Conservatory of Music. As an indication of her musical inclinations, it was reported that she had mastered more than one hundred classical compositions. In her spare time, she copied music in New York Point, kept house, cooked, read and typed. A professional musician who evaluated her capabilities reported that despite the fact that technique and tone quality were missing from her music, she did play notes accurately, obviously deriving pleasure from playing and feeling emotional quality and rhythm.



Other contemporary deaf-blind persons have been mentioned in the literature. Mitchell (1958) reported on the case of Jack Boyer, a former student of the New York Institute for the Education of the Blind, who developed special abilities in science and went on to attend St. Thomas College in St. Paul, Minn., where he majored in electronics. Jones (1958) discussed a deaf-blind female poet encountered during a trip to the Soviet Union. This deaf-blind person, called the Helen Keller of the Soviet Union, was the first deaf-blind person in that country to be taught to speak. Her voice was described as being low "with clear rapid articulation." Holt (1933), a deaf-blind person, described her ability to perceive vibrations at musical events and from a specially designed radio set.

At the 1959 annual convention of the American Association of Workers for the Blind (AAWB 1959), Winthrop Chapman, a deaf-blind person reported his experiences as a poultry farmer, working side by side with his father. Among his leisure pursuits were: weaving, maintaining correspondence, transcribing material into Braille, reading and playing games. At the same AAWB meetings, Jack Murphy, a deaf-blind man, reported his experiences in conducting a chair caning and furniture repair shop maintained in his cellar in St. Louis, Mo., for 22 years. As a result of the important social and economic benefits derived from this enterprise, Murphy recommended it as a possibility for other deaf-blind persons, indicating that he knew of two similar shops conducted by individuals who were deaf and blind.

Richard Kinney and Robert Smithdas are two of the most celebrated deaf-blind persons on the current scene. In a letter (1957) addressed to Annette Dinsmore of the American Foundation for the Blind, Kinney described his work as an instructor with the Hadley School for the Blind, a correspondence study institution. Skilled in Braille and Tellatouch, an instrument that transcribes letters of the alphabet into Braille characters through the use of typewriter keyboard, he conducts a number of correspondence courses, handles his own mail and lectures skillfully to diverse audiences. As a gifted public speaker, Kinney functioned as a fund-raiser and public education counselor for the Hadley School for some years and currently is the Associate Director of that organization. In addition to his gifts as a public speaker, Kinney, a devoted father, is a gifted writer of poetry and prose.

### "Handicapped American Of The Year"

Robert J. Smithdas (1958) has related his life story graphically in a biographical work which received wide distribution and favorable reviews. As a deaf-blind person, he not only obtained a bachelor's degree from St. John's University in Brooklyn (the first deaf-blind person to earn such a degree since Helen Keller did it early in the Twentieth Century) but went on to earn a master's degree as well in rehabilitation counseling from New York University. Athlete, author and raconteur, he enjoys a full personal life, living alone in his own apartment, entertaining frequently, and specializing in fine cooking.

After some years as a community education counselor at The Industrial Home for the Blind, Smithdas is now Associate Director of the Department of Services for Deaf-Blind Persons at that agency. In this position, he has heavy administrative, interpersonal and leadership responsibilities. In addition to extensive participation in fishing, reading, dancing and social activities, he is a



poet who has achieved community recognition for his work. In 1966, Smithdas was designated "Handicapped American of the Year" by the President's Committee on Employment of the Handicapped.

Dr. Gerrit van der Mey (Committee on Services for the Deaf-Blind 1959), a resident of the Netherlands, is a distinguished mathematician who, despite deaf-blindness, has been a computer programmer for the past 15 years. Using an ingenious means of telephone communication, he maintains contact between the utility company which employs him and his own home some 40 miles away. Dr. van der Mey has published three standard works on programming which have been used extensively as university textbooks.

Incomplete as it is, this list of deaf-blind persons is impressive indeed. Despite limited opportunities, long periods of neglect, and lack of adequate services, most of these deaf-blind individuals achieved distinction and personal happiness. Obviously, these people are exceptional. In contrast, for each instance of high achievement are dozens, perhaps hundreds, of deaf-blind persons who could not overcome their disabilities with existing personal and community resources. The life stories of exceptionally successful deaf-blind persons seem to suggest two important generalizations: (1) even without extensive assistance, some deaf-blind persons can achieve success in our society. (2) some of the non-achievers might have succeeded if adequate services had been available. It is difficult to estimate the extent of the loss of human talent and capability that has resulted from apathy toward deaf-blind persons. It is probable that, under more favorable service circumstances, the list of distinguished deaf-blind persons would be far more extensive. The challenge of the present is to prevent the occurrence of such wasted human resources in the future.

## Communication

Although considerable stress in the literature has been placed upon the mechanical aspects of communication, the psychosocial component has not been neglected. The Committee on Services for the Deaf-Blind of the World Council for the Welfare of the Blind (1959) suggested that the interpersonal situation of the deaf-blind person takes precedence over the transmission and reception of messages, per se. The underlying assumption is that communication is not an end in itself but flourishes only in a social setting when there is something to be communicated. Thus, even an efficient communication system would be underutilized if the communicators were reluctant to interact or had little of common interest to share. The Report to the World Council (1959) states the matter in these terms:

"So many deaf-blind persons remain in isolation without communication of any kind that they make little or no effort to communicate except to take care of the need of the moment. You may find, even in homes where there are relatives or children who have a deep affection for the deaf-blind member of the family, that the difficulty of communicating has been so great that all effort has been abandoned and only the basic needs of the human being are being met — food, clothing, shelter, etc. Even these, despite affection and willingness on the part of the relative or friend, may finally be neglected to some extent unless some re-establishment of communication is developed."

Bettica and others (1958) also perceived communication in interpersonal terms but attributed the problem, in part, to the seeing and hearing communicator.

"Those of us who see and hear and generally have all of our faculties . . . have all too often given way to a feeling of helplessness and inadequacy . . . For most of us, deaf-blindness creates an insuperable wall — only because we have little knowledge of the effect of deaf-blindness in the human organism."

Once a social-psychological climate encouraging communication has been developed and the participants in the relationship are motivated to communicate with each other, the problem of method becomes a critical consideration. Prior to discussing specific communication methods in this paper, it is important to assess the general requirements for any communication system for deaf-blind persons. The Report to the World Council (1959) delineated the role of touch in the communication process:

". . . the only way that we can reach the intelligence of the deaf-blind human being is through the sense of touch . . . the senses of smell and taste can have great importance to a deaf-blind person; but, for the purpose of communicating, hands become the substitutes for sight and hearing. Generally speaking, even when his hands appear not to be registering or understanding, each contact they make brings a world of information — yes, and even of encouragement to further contact."

### Need For Appropriate Language

The communication problem of the deaf-blind adult differs from that of the deaf-blind child in at least one vital respect. However imperfect the language skill may be, the assumption is that the deaf-blind adult has some language. Assisted by his previously acquired language, the more fortunate deaf-blind person copes with problems that are primarily social rather than conceptual. In the absence of language, however, even in the context of a warm interpersonal relationship that encourages communication, verbal exchanges between individuals are delayed until the crucial discovery is made that a symbol can represent a reality. Consequently, a major challenge to educators of deaf-blind children is that of building a bridge between human experience and the language symbols which represent the essence of such experience.

Indeed, there is good reason to believe that not only communication, but intellectual and social development are seriously retarded until an appropriate language is acquired. Additional reference to the language problem will be made in the section of this paper concerned with education.

In July 1957, at a meeting of the Committee on Services to the Deaf-Blind of the World Council for the Welfare of the Blind (1959), criteria were established for an effective communication system for deaf-blind persons:

"1. It must be designed to meet the communication needs of all deaf-blind persons with particular concern for the needs of the adult deaf-blind.

"2. It should be a basic identifiable form or pattern with some relationship where possible to the known alphabet.

"3. It must provide that the receiving hand be passive and relaxed, avoiding all manipulation by the hand of the receiver.



"4. It must provide that every letter be definite and positively applied, with no possibility of confusion either in form, structure or application.

"5. It must provide reasonably comfortable usage regardless of the position of the sender and receiver in relation to each other.

"6. It should provide, if possible, a method of communicating on other than the palm of the hand if the hands of the receiver are preoccupied.

"7. It must provide that the hand of the receiver be visible either to the eye or to touch throughout the sending procedure for purposes of positioning letters when applied.

"8. It must provide for the positive positioning of each letter, and particularly the vowels, so that language adaptations requiring accent marks may be placed without confusing the receiver.

"9. It must provide for the least amount of movement in the making of each letter on the part of the sender.

"10. It must be simple enough in design to be learned and memorized by the slow, the elderly, and the less competent — whether deaf-blind receiver or seeing-hearing sender."

#### Basic Approaches Suggested

Two types of communication approach are used by deaf-blind persons today — hand and mechanical device. Dinsmore (1959) in her comprehensive review of modes of communication suggested that the use of the hand has a psychological value in that it establishes a rapport between the communicating parties not unlike that developed through visual and auditory means. She observed that professional workers have a responsibility to ascertain the method preferred by the deaf-blind person, and then to establish communication with him through that method. Thus, a prerequisite to the provision of educational and rehabilitation services is the establishment of some means of communication between the participants. Dinsmore indicated that, despite the psychological advantages of touch methods, mechanical devices may facilitate communication with the public by making it easier and more convenient for them.

The Committee on Services to the Deaf-Blind of the World Council for the Welfare of the Blind (1959), in its guidelines for the helper of deaf-blind persons, suggested basic approaches to communication with deaf-blind persons. Among these are:

"Learn and use the method of communication which he knows, however simple."

"Help him to learn and use a more adequate method of communication if this will help him to a fuller living."

"Encourage the deaf-blind person to use his voice in response if he has speech."



"Be sure he understands what you are telling him or interpreting for him, and be equally sure you understand him."

"Encourage him to use the words he knows, however, limited, supplemented by signs and gestures only where necessary."

"Let him know when it is appropriate for him to speak or when there is an interruption or pause in the conversation or activity around him."

"Do not use abrupt or exaggerated gestures — they may be disturbing or misunderstood."

"Use firm but gentle application of signs, signals or other communication."

"Be patient — then have more patience. The need for patience in communicating will become apparent to you. The helper who has patience and understanding with the deaf-blind person will find a profoundly satisfying and rewarding experience."

### Only Means For Uninformed Public

The most common tool of communication available to the public and the deaf-blind adult alike is a simple use of block letters printed on the palm of the hand with firm bold strokes. This method provides for immediate communication without lengthy additional training, although, if needed, reference may be made to a chart indicating the direction and sequence of the strokes. This approach, called the International Standard Manual Alphabet, was accepted by the Committee on Services to the Deaf-Blind of the World Council for the Welfare of the Blind (1959) as the internationally useful device for communicating with deaf-blind persons. Taking into account that local and national preferences and conditions warrant the use of other approaches at times, the Committee perceived the International Standard Manual Alphabet as having a potential universality that no other method could rival.

"It was recognized immediately that imprinting block alphabet formations on the palm of the deaf-blind person, while slow, was possibly the only method that could be used by an uninformed public in communicating with deaf-blind persons."

Both Dinsmore (1959) and the Committee on Services for the Deaf-Blind (1959) reviewed various other communication techniques in some detail, including:

#### 1. The American One-Hand Manual Alphabet

Using one manual sign for each letter of the alphabet; this approach is used widely by deaf and deaf-blind persons in the United States.

#### 2. The British Manual Alphabet

This approach also uses one sign for each letter of the alphabet. However, both hands are used simultaneously in forming the letters.

It is most often used in English-speaking countries other than the United States.

### 3. The Lorm Alphabet

Developed in Europe in 1881, this approach uses dots and arrows applied to the palm or the back of the hand of the receiver. It is found most frequently in European countries. The Committee on Services for the Deaf-Blind suggested the possibility of evolving a rapid manual alphabet for international use by combining, in some way, the British Manual Alphabet and the Lorm Alphabet. At this writing, this goal has not yet been achieved.

### 4. The American Two-Hand Manual Alphabet

This approach is not widely used since it requires the use of both hands of both communicators and is comparatively slow and awkward. (Dinsmore 1959)

### 5. International Morse Code

With a tap representing a dot and a stroke representing a dash, the Morse Code may be communicated by touch with speed and effectiveness. A perceived advantage is that the Code may be transmitted to any part of the body, leaving the receiver's hands free for other activities.

### 6. Braille Hand Speech

Based upon an imaginary Braille cell in the receiver's palm, the sender reproduces the equivalent of Braille dots representing letters, combinations of letters, and words as in the Braille System.

### 7. Sign Language of the Deaf

This approach, by-passing the alphabet, is useful for deaf persons who, after learning to communicate in signs, became blind. The speaker takes the hands of the deaf-blind person in his and moves them in accordance with the configurations of customary sign language symbols.

### 8. The Alphabet Plate

Using a metal plate which is embossed with the regular alphabet, the sender guides the index finger of the deaf-blind person from letter to letter on the plate, spelling out the words in his message.

### 9. The Alphabet Glove

A glove which has the letters of the alphabet imprinted upon the surface of the palm is donned by the deaf-blind person. The sender uses his index finger to indicate each letter by touching that area of the glove assigned to the desired letter. Numbers are printed on the reverse side of the glove and are indicated by touching the back of the hand.

## 10. The Talking Disc

This device consists of a wheel embossed with Braille and Moon type symbols corresponding to printed letters of the alphabet. By rotating the disc, the sender brings to the finger of the deaf-blind person the Braille or Moon type symbol desired.

## 11. Braille Alphabet Card

This device is similar to the Alphabet Plate, except that instead of embossed letters of the alphabet Braille signs are used to represent each inkprint letter. As in the alphabet plate, the deaf-blind person's index finger is moved to the appropriate Braille sign.

## 12. Cut-Out Letters

Each of these letters is handed to a deaf-blind person in succession to spell out the message. Although slow and cumbersome, it is sometimes used with elderly, newly deaf-blind persons.

## 13. Tadoma Method

Used to teach deaf-blind persons to speak and to understand the speech of others, this method requires skill on the part of both the teacher and the student and a lengthy learning period. The deaf-blind person places his hand on the face of the sender and through sensing jaw, mouth and throat movements, he "reads" the message. Ordinarily, this method is confined to individuals who learned it in childhood. Although the method is speedy and tends to conserve the speech of the deaf-blind person, some individuals question the social desirability of placing one's hands on the face of another person.

## 14. Braille

A message written in Braille in the customary manner may be read by deaf-blind persons who are familiar with the system. This method is limited in its applicability because some persons blinded in adult life may find Braille difficult to master. Some deaf-blind persons who acquired deafness long before they became blind may resist learning the system.

## 15. Typing and Script Writing

Some deaf-blind persons are fully capable of sending messages through the customary typing and script-writing channels used by blind persons.

## 16. The Tellatouch Machine

In this approach, the sender depresses a key on a typewriter keyboard elevating the corresponding Braille sign which can then be perceived by the deaf-blind person. Although some of these machines are electronically activated, the one most commonly used in the United States is operated mechanically, requiring neither electric current nor batteries.



## 17. The Tactaphone and Its Successors

After reaching the telephone number of the deaf-blind person, the sender, using an ordinary telephone, employs the Morse Code, dialing number one for the dot and number four for the dash. The dot and dash impulses are transmitted over the telephone wires to the special phone designed for the deaf-blind person. This phone contains a vibrating disc installed in the reverse side of the telephone receiver. By placing his finger on this disc, the deaf-blind person can perceive the short and long vibrations, and thus can interpret the message. An improved version of this device — the sensicall — has recently been developed by the New York Telephone Company and the Western Electric Company throughout the United States and is available for rental on a fee basis. This device, originally designed for deaf persons, has been adapted for the deaf-blind by substituting tactile for visual signals.

## 18. Speech

The deaf-blind person who has intelligible speech is in a favorable social position and should be encouraged to use this ability as frequently as possible. The preservation (and, sometimes, the improvement) of speech is often accomplished with the assistance of speech and hearing specialists.

## Search Goes On For Universal Method

It is important to note that each of the aforementioned methods may have value for certain deaf-blind persons under certain conditions. At the present time, much individualization is practiced by means of matching the communication system to the particular deaf-blind person.

However, the search goes on for a universal method which, unlike the methods described here, will have all the advantages of ease, universality and simplicity, and none of the disadvantages of complexity, slowness, inaccessibility to non-disabled persons and awkwardness. Until the hypothetical day dawns when such a system may appear, the existing methods will be used selectively. To be effective, however, the system adopted must be managed readily by the untrained, sighted person. Consequently, many professional workers prefer a print-on-the-palm method. On the other hand, deaf-blind persons with long previous experience with deafness tend to prefer a manual alphabet or a sign language unknown to the man-in-the-street. Ideally, the deaf-blind person will learn both approaches so that he can achieve the speed and facility found in the manual alphabet and sign methods without sacrificing ease of contact with the lay public.

In summarizing the landmark 1957 conference on communications for the deaf-blind conducted in New York City, Keane (1957) noted a need for research in four areas:

1. A neurological study of the sensitivity of different areas of the hand and the body with respect to the reception of touch messages.
2. New methods of communication.

3. Methods of learning or maintaining speech.
4. The process of offering services to deaf-blind persons.

### Psychological Aspects

The psychophysical and psychosocial aspects of deaf-blindness have fascinated numerous individuals over the centuries. From Diderot on, however, psychological speculations about deaf-blind persons have been made with little supporting evidence. Indeed, unverified judgments and suggestions make up the bulk of the psychological literature of deaf-blindness. Despite this, a few items merit review.

Some of the most revealing psychological materials emanated from studies of a single case. Hall (1879) investigated psychological aspects of Laura Bridgman's adjustment and arrived at the following generalizations:

1. Conceptions of aggregates are formed only with great difficulty.
2. Despite many memories of childhood, she retained no memories of vision.
3. In some instances, her tactile sensitivity was two to three times that of the "normal" person. Yet, in some sense areas her threshold was half of that of the "normal" person.
4. Her sense of equilibrium was fairly easily disturbed, resulting in dizziness.
5. Although she appeared to sleep less and more lightly than the "normal" person, she almost always had dreams in which her facial expression, lips and fingers constantly moved and changed. She retained little recall of the content of her dreams.
6. Although early in her training she revealed originality of thought, and although Samuel Gridley Howe attempted to preserve this originality, it soon deteriorated and she became conventional in her thinking.

### Miss Keller Undergoes Series of Tests

Donaldson (1892), on the other hand, became interested in the visual area of Laura Bridgman's cortex. He concluded that her blindness had impeded brain development, especially in those areas which develop somewhat later. However, the fundamental visual areas which develop most early and are more resistant to change were comparable to similar area in the brains of other persons. He concluded: "In this brain, the entire visual area of the brain is clearly demarcated by a "light line."

As may be expected, Helen Keller generated interest among psychologists. McFarland (1896) reported that Helen Keller had not lost visual and aural impressions of her first eighteen months of life. Although these impressions were not consciously recalled, they were subconsciously available to her as a foundation upon which subsequent learning had been built. McFarland felt that these impressions were instrumental in Helen Keller's ability to form concepts of sound, color and vision and to visualize nature.



Jastrow (1894) administered a series of tests to Helen Keller which resulted in the following findings:

1. Her fingertips and palms were more sensitive than those of "normal" persons.
2. The form sense of her fingertips was average.
3. She was very sensitive to vibrations of tuning forks.
4. Her ability to localize objects was average for a seeing person with his eyes closed.
5. She had greater than average sensitivity to pain on the fingertips.
6. Her memory for words was above average. She was able to repeat without error a series of ten to thirteen words.

In a case study approach, Merry (1930), reporting on one deaf-blind child, noted auditory but not visual imagery. Goodenough (1932) studied a 10-year old deaf-blind child who had received no formal training. The language of gesture and facial expression used by this child was judged to be almost purely egocentric, with social factors playing an insignificant part. After an extensive description of the child's behavior, which was spontaneous and without apparent social shaping, Goodenough concluded by wondering about the role of social training in the development of the behavior of "normal" children.

As part of a review of the psychological aspects of deaf-blindness, Cohn (1954) stated his belief that deaf-blind persons have a sixth sense (apparently referring to the obstacle sense or "facial vision" explored by Worchel and other investigators). Cohn noted that some experimenters feel that this sense is located in the ear. However, consistent with his belief that deaf-blind persons have this sense, Cohn took the position that it is located in body areas other than the ear. Cohn declared that it can be situated anywhere in the body but is strongest in the upper arms, skull and feet. With special reference to this sense, he concluded that some of the effects of deaf-blindness can be offset by the development of substitute functions.

#### Rothschild Report One of Merit

Cochran (1930) also expressed an interest in the sensorium of deaf-blind persons. She held that kinesthesia (the movement sense or the muscle-tendon-joint sense) is more important than the senses of sight and hearing. From her own experience, Cochran characterized this sense as the "gateway to knowledge" and attributed some of Helen Keller's achievements to it. Although the ear is the usual receptor, vibrations also can be received through muscles, tendons and joints. As examples, she describes Helen Keller receiving and enjoying vibrations by placing her hand over the closed top of a piano and Helen Martin placing her knee against the front board while playing the piano to detect unexpected vibrations (wrong notes). Wade (1909) took the position that the deprivation of one sense is not necessarily balanced by a compensating development in another sense. He reported observations of the extraordinary sense of smell exhibited by some deaf-blind persons but unable to account for it.



The foregoing materials suggest that our knowledge of the psychosocial aspects of deaf-blindness is not altogether adequate. Studies of the personality dynamics, the organization of thought, cognitive factors, ideation, emotional response, and virtually all other aspects of the behavior of deaf-blind persons, are not available in any number. The foregoing materials are generally weak in terms of sampling, objectivity and experimental method, and they reveal relatively little about those aspects of human functioning that are most relevant to educational and rehabilitation programs. One of the few investigations of merit in this area was conducted by Rothschild (1958) as part of the IHB study of the rehabilitation of deaf-blind persons. Rothschild reports the following general impressions of personality:

1. The need for more help tends to foster a sense of dependency among deaf-blind adults and, consequently, a sense of anxiety. As a defense against this anxiety, the deaf-blind person may adopt dominant striving behaviors which seek out verification of the availability of help, as such. This persistent need to confirm sources of assistance in the environment may be as important as the actual goal for which the help is presumably sought.

2. Since the deaf-blind person is less capable than others of determining the availability of help in the environment, and since he may have more difficulty in ascertaining the reliability of the helpers, he may feel a greater compulsion to reassure himself of its existence and quality.

3. Difficulty in perceiving his surroundings renders the deaf-blind person unable to see himself realistically in relation to the environment. Consequently, the deaf-blind person often acquires such an unreal concept of himself that it impairs his ego-functioning.

4. Differences in reality orientation tend to reflect themselves in differences in personality processes and the quality of human relationships. Consequently, it may be advisable to look upon the personality dynamics of deaf-blind persons from the vantage point of premises that differ from those used in viewing the personality dynamics of others.

5. There is a tendency for deaf-blind persons to involve themselves totally in their adaptation to a given set of circumstances. Thus, once committed to a position, it may be more difficult for them to relinquish it, thus limiting the reorganizing value of new experiences for them.

6. Social isolation results in different social values for the deaf-blind, thus restricting the effectiveness of externally-imposed social stimulation as a spur to the use of one's creative energies.

7. The deaf-blind person's limited ability to interpret relationships and subtle nuances of response limit his identification with others and the depth at which "face-to-face relationships" may be maintained.

Rothschild concluded:

"In the case of deaf-blind persons, there is a larger number of very basic needs which defy successful gratification. The help which is

available to them may not be comprehensive enough to cover even all the basic personal requirements . . . His handicaps compel him to rely on the service which is available to him . . . This obviously deprives him of a good deal of self-determination. The room for self-assertion is narrowed down and, with it, the area for self-expression. This may possibly restrict, even more, the range of free personal functioning which is already very limited because of deaf-blindness. The particular nature of, the dependency on, and the realistic limitations of available services to deaf-blind persons limit the chances of the development of certain potentials even more than is the case for other handicapped persons . . . "

### Critical Need For Additional Efforts

Myklebust (1956), in a paper devoted primarily to educational diagnoses, presented some observations concerning the psychological aspects of deaf-blindness. He characterized hearing and vision as distance senses as opposed to touch, smell and taste which are close senses. Distance senses develop later in humans but, when they do, they become primary in exploratory and contact activities. When either distance sense (sight or hearing) is lost, sensory behavior shifts to the remaining distance sense. Similarly, a shift occurs to close senses when both distance senses are lost. Thus, the deaf-blind child, especially the one who has had the double disability from birth, uses the tactile sense as the basic avenue of information, supplemented by the olfactory sense which fills a type of scanning function.

The gustatory sense serves a secondary purpose. Myklebust suggests that the diagnostician working with deaf-blind persons is required to determine the degree of success achieved by the individual in making a sensory shift. With this knowledge, the educator can build an educational program by expanding on what has already been shifted to the residual senses.

The sparseness and the limited quality of the literature on psychological aspects of deaf-blindness underscores the critical need for additional effort in this area. Fundamental research on sense behavior should be pursued as basic to all other research on deaf-blindness. However, well designed, applied studies are needed no less in such areas as the learning process, the development of cognition, the evolution of concepts and abstractions, the effects of socialization experiences, and the development of meaningful contacts with both object and the human environments.

At present, the area of scientific inquiry into personality development among deaf-blind persons is virtually unexplored. As soon as possible, appropriate investigations should be undertaken in the personality development of deaf-blind children, adolescents, young adults, and older adults; mental health problems; the social perceptions of deaf-blind persons; the influence of such perceptions on behavior; and the processes of social interaction among deaf-blind persons and between deaf-blind persons, deaf persons and blind persons, and seeing and hearing persons.

### Diagnosis for Education and Training

Although the need for educational and rehabilitation diagnosis for deaf-blind individuals has been recognized for many decades, the development of a utilitarian diagnostic procedure has been difficult to achieve. Indeed, suitable



diagnostic instruments and procedures have emerged only within recent years. Merry (1932) suggested that the quantitative scores derived from intelligence tests should be used with caution. However, he noted that if the deaf-blind child is given an opportunity to become accustomed to the novel situation encountered in testing and if the results are used qualitatively, test findings may have value for educational planning.

Root (1960) reported the procedures employed by a diagnostic team at Syracuse University. Children were observed over a four-day period during the taking of social and medical histories, the administration of psychological examinations and hearing tests, and the gathering of other relevant data. Although each specialist (pediatrician, ophthalmologist, otologist, pediatric neurologist, speech and hearing consultant, psychologist and educator) saw each child independently, it was possible for one practitioner to observe the examinations of the others. After the examinations were completed, the clinical team discussed the findings with a worker from the child's home area. It was expected that this worker would follow-up locally on the findings.

The Royal National Institute for the Blind (1962), reporting on a seminar for the education of deaf-blind children, suggested the following classification:

1. Total or sub-total deaf and blind children (the visual and aural losses are both quite severe). Braille methods are appropriate with this group.
2. Partially deaf children with severe visual loss. These children are served best by teaching methods similar to those used with the blind.
3. Partially blind children with severe visual loss. These children are served best by teaching methods similar to those used with the deaf.
4. Partially deaf and partially blind children. Methods using hearing and sight are appropriate for this group.

Pathways, at Conover Hall in England, is recognized as the national assessment center for children who are suspected of having a dual handicap. Experience has shown that evaluation is especially difficult with children who are born both deaf and blind. Suitable diagnostic indicators are drawn from such instruments as: The Stanford-Binet, the Cattell, the Arthur Point Scale, the Nebraska Test of Learning Ability, the Ontario School Ability Examination, and the Haptic Intelligence Scale for the Blind. Among the audiometric tests which have been used are a psychogalvanic skin response test, play audiometry, and (experimentally) the Vannus I, an approach in which electroencephalograph electrodes are placed over dominant auditory areas. As auditory stimuli are presented, a computer analyzes the electrical activity response. Apparently, there has been some controversy concerning the respective merits of vibration and manual teaching methods. Currently, the tendency is to teach communication by any method, including speech, without giving undue emphasis to speech as a communication modality.

Myklebust (1956) suggested that ophthalmological, otolaryngological and psychological evaluation of the deaf-blind child is especially difficult because



of the interaction of the various losses. Thus, neurological and psychological conditions may not only influence ophthalmological and otolaryngological findings, but in turn may be influenced by them. The age of onset and the order of appearance of the two disabilities can be highly significant. Thus, deafness preceding blindness and blindness preceding deafness may lead to different personality structures and, thus, to different educational problems. As may be expected the child who never possessed either sense differs from the other two groups mentioned above.

Myklebust suggested hearing evaluations for different age groups of deaf-blind children. At all ages, there should be an appraisal of ears, nose and throat. Below the age of three, the clinician may use sound instruments (e.g. selected bells), free field amplified sound tests (recorded tones, music and voice), and psychogalvanic audiometry. During the period from ages three to six, play audiometry is recommended. After the age of six, pure tone audiometric tests are useful except in instances of brain damage, in which case, play audiometry will be helpful.

Myklebust also recommended tests of vision, olfaction and gustation. He suggested that the neurological examination should include an electroencephalogram. Among the psychological tests suggested were: selected items from Van Lugt V. D. L. Psychomotor Test series, other adapted maze tests, the Seguin Formboard, and tests which involve matching geometric forms, copying a block model and identifying stencilized drawings. Through demonstration and imitation, examiners should assess three types of language development: inner language, receptive language and expressive language. The emotional status of the child should be studied through history and observation.

Burns and Stenquist (1960) described an evaluation procedure for deaf-blind children that includes a history of pre-natal and birth factors, genetic development, emotional adjustment, language behavior and educational experiences; coupled with a study of residual sensory capacities, neurological examinations, and psychological assessments of mental and motor capacity, social maturity and emotional adjustment. Among the difficulties encountered in evaluating the deaf-blind child are: communication problems which prevent the examiner from "reaching" the child and environmental deprivation. These influences may produce a false diagnosis. Educational planning depends upon an accurate evaluation by a skilled team which can differentiate mental defect from normal ability blunted by lack of experience.

Rothschild (1959) discussed the use of various psychological instruments with deaf-blind adults, including:

1. Intelligence tests (The Wechsler-Bellevue Scale, Form I, Verbal).
2. Manual Dexterity Tests (The Pennsylvania Bimanual Work Sample, the Purdue Pegboard and the Minnesota Rate of Manipulation Test).
3. Projective Techniques (Sentence Completion).

After discussing the need for effective communication and a relaxed relationship in the testing situation, Rothschild indicated the desirability of allowing additional time for the psychological evaluation of a deaf-blind person. On the basis of his experience, he offered the following generalizations:

1. Despite difficulties, the psychological examination of a deaf-blind adult is a feasible undertaking.

2. Depending upon the client's needs and capacities, a variety of means of communication may be used in the examination.

3. The psychologist evaluating the deaf-blind adult will be helped by having had experiences with deaf-blind clients in settings other than the clinical situation.

4. The work of the psychologist serving deaf-blind adults is enhanced by the psychologist's participation on a professional rehabilitation team.

Although some beginnings have been reported in the diagnosis of deaf-blind children and adults, this phase of service to deaf-blind persons still lacks scientific support. Systematic work is needed in all areas of evaluation with special deficiencies being noted in the assessment of personality and educational and rehabilitation potential. However, even under current circumstances, the relatively crude data emerging from the evaluation of deaf-blind children and adults can be useful. At present, insufficient use is being made of even those few instruments and procedures that are already available. A wider and more skillful use of such techniques would constitute a positive step forward in developing realistic educational and rehabilitation plans for deaf-blind individuals.

#### Pre-School Services

Almost without exception, educators acknowledge the value of pre-school services to deaf-blind children. Consequently, efforts have been made to find such children as early as possible and to introduce educational, psychological and social services to them long before entry into school. Some of the most revealing articles in this area are the progress reports issued by the mother of one deaf-blind child who, in addition to maintaining the degree of personal involvement that might be expected of a parent, expressed a clinical interest in the development of her child.

Bowman (1945) described the first three years in the life of Carol, born deaf-blind. Through the use of a stable schedule, Bowman was able to give security to her daughter. Whenever Carol was handed any object, an indication of its function was given simultaneously to her. Gradually, she was taught the usual expressions of affection. Then, in response to her achievements, she was given hugs and kisses.

Although she had relationship with her father and a woman who stayed with her during the day, Carol related the concept of Mama to her real mother exclusively. For her part, the mother obtained special training in the education and development of deaf-blind children. Although continuing to be somewhat obstinate, Carol became more tractable as she gained confidence in her teacher-mother. Vibration training started at age one and by the time she was three years old, she was quite aware of vibrations and sometimes responded to speech without actual contact. Through training, she learned to say "Mama" and to become aware of the fact that the use of the word Mama produced action while crying did not. Although attempts were made to have the child understand that everything has a name, she was apparently too young to grasp this concept.



This teacher-mother reported that she was guided by six rules in her activities with her deaf-blind child:

1. In order to develop an objective attitude and to better understand hearing handicapped children, she worked with speech handicapped youngsters in an educational setting.

2. She developed the child's capacities to the fullest at the earliest possible age.

3. Good habits were stressed from the beginning so that bad ones would not have to be broken subsequently.

4. By giving the child varied contacts with people, she was made more acceptable to society. Although a routine was important, realistic training demanded an occasional break in this routine.

5. The child's independence was encouraged by having her do things for herself.

6. When a lesson was begun, it was seen through to its conclusion.

Bowman (1946) subsequently added to this record by describing Carol's fourth year. Efforts were made to widen awareness (using her response to some sounds and her partial vision) through field trips and a diversity of experiences. After age three, walking was emphasized. Currently, mother and daughter were able to walk together in public and accept the possible stares of onlookers. At age three and a half, Carol entered the hospital for a tonsillectomy.

The surgery and the hospital stay were accomplished without undue stress. Although training tended to reward positive behaviors and minimize negative ones, toilet training had not yet been completed. During this period, Carol used her residual sight to a greater extent, and more often than previously her voice reflected her mood. No new words were learned after the mother stopped manipulating the child's speech.

Berhow (1963) emphasized the critical role of the family in the pre-school years in paving the way for further educational experiences in school.

Riley (1959) described the case of a six-year old deaf-blind child who had been brought to the University of Kansas for study. Experience with this youngster and, subsequently, with nine others with severe hearing and visual impairments, contributed to the development of services to deaf-blind children in Kansas. The Royal National Institute for the Blind (1961) reported on its work with pre-school deaf-blind children. In this setting, it was generally felt that awareness of the environment must precede the initiation of training. As a result, in the beginning, deaf-blind children were handled by only one or two persons so that a relationship and a consistent approach were developed. The teacher achieved a fine balance between the objective and the personal.

In the home, it was recommended that only the mother should handle the child initially. New elements and new persons should be introduced gradually into the child's life, preferably one at a time. Communication was regarded as

the key to the child's subsequent growth. Although some children who have been taught to communicate after the age of ten have made adjustments, it was not known how different these adjustments might have been if communication had begun at an earlier age. A nursery school program was recommended as a means of indicating the child's potentiality, providing parents with a respite from their responsibilities, and offering parents an opportunity to observe teaching methods.

The literature stresses the vital role of the mother in the development of the deaf-blind child. The Royal National Institute (1961) offered the following suggestions to mothers whose children acquired deaf-blindness early in life:

1. During the first six months, contact with another parent of a deaf-blind child can be reassuring.
2. From six months onward, parents should receive assistance from a counseling service which informs them about the most efficacious means of helping the child.
3. From age two years up, regular assessments of the child should be conducted in an educational environment with the parent participating.
4. There should be provision for care for the child when the family is in stress or needs a "break".
5. Services available to parents should be widely publicized.

The American Foundation for the Blind (1955) issued a set of suggestions for parents in the form of simplified materials designed to help ease parental feelings of hopelessness. Basic suggestions included: develop independence and self-reliance in the pre-school years, explain the purpose of everyday objects, give reasons for behavior, talk to the child naturally as if he had hearing (this helps the parent to feel at ease), play with him as if he weren't handicapped (for exercise and for developing personal relationships), and take him on family outings (to give him a sense of belonging and to widen his horizons).

Since he lacks the incentives of sight and hearing in acquiring walking skills, the child may need more stimulation and help than other children at various stages in the process. Through touch, give the child an opportunity to "see" the process of chewing, the use of the knife and fork, and eating in general. Through frequent diaper changes, the child may learn that the clean state is a more comfortable one. Assist him to associate toilet facilities with the eliminative processes. Indeed, real progress will have occurred when the child understands the purpose of such facilities. Watch for signs of toilet needs and try to associate these with a socially acceptable signal.

Since sensory stimuli do not inform a deaf-blind child of night and day, his sleep habits may become confused. Through keeping the child active and limiting sleep during the daylight hours, a strict routine may build customary daytime and nighttime habits in the child. Since he cannot imitate others, the deaf-blind child learns to dress himself through constant repetition and help. After selecting easy-to-handle clothes, help the child to examine each garment so that he can learn its characteristics and differentiate front and back. As you dress the child, keep his hands on yours so that he can become aware of the essential



movements of dressing and undressing. Speech training should begin as early as feasible avoiding over-concern and undue focus.

In general, The American Foundation booklet stated that it should be expected that the pre-school child will take longer to learn things than many other children. In addition to giving him all the time that he needs, parents should praise the deaf-blind child for successful performance. It is important to expose the child to new experiences as often as possible.

The literature relating to pre-school experiences with deaf-blind children suggests that there is a considerable body of experience with young children that has not been adequately systematized and reported. Although such material is highly pragmatic, reflecting little theory and research, it appears to be highly practical and educationally meaningful. Consequently, additional effort should be made to bring together all the recent experiences of parents, teachers, counselors and psychologists with deaf-blind children and to present these data to an orderly and organized fashion so that the current body of knowledge may be codified, studied, and most important of all, subjected to verification in a variety of institutions and settings.

## Education

Since the early experiments conducted by Samuel Gridley Howe in the education of Laura Bridgman, educators in the United States and elsewhere have sought effective means of educating deaf-blind children. Burns (1958); Burns and Stenquist (1960); Andrews (1936); Farrell (1956); and various issues of the *Lantern* (e.g. March 1964), a publication of the Perkins School for the Blind, have traced the history of this educational movement. The trend has been away from isolated dedicated individuals laboring alone against insuperable odds to open new worlds for deaf-blind children toward an organized and cohesive professional discipline with a body of knowledge, avenues of professional communication, and an evolving research effort. Earlier contributions to the literature were inclined to stress the experience of a single deaf-blind child, recounting in detail his development under the guidance of an unusual teacher (e.g. Anagnos 1882, Barbour 1934, Fish 1937, and Welfare Reporter 1947). Recent contributions to the literature have focused upon more generalized issues, especially program descriptions and teaching methods.

The literature contains a number of program descriptions emanating from European countries. Typical of these are reports by Hirsch (1929) and Colligan (1954). Hirsch stated that the school for the deaf-blind in Germany (Oberlin located at Nowawes) was founded in 1906 by Pastor Hoppe who was influenced in his work by the writings of Helen Keller and the program of the Venensborg School in Sweden. Prior to the opening of the school, Pastor Hoppe, who had taught his first deaf-blind student in 1886 aided by a teacher of the deaf, conducted a census and found that there were 500 deaf-blind children in Germany, half of whom were educable.

In 1912, facilities were expanded through the opening of a new building accommodating 70 deaf-blind individuals. The school was conducted by clergymen assisted by nurses from the Order of Diakonissen. At the time Hirsch's paper was written, 40 deaf-blind students were in residence. Initial training was through the medium of touch. As the child developed, teachers introduced Braille, writing, articulation, the finger alphabet, the Bible, academic subjects, recreational activities and occupational skills. Although many of the deaf-blind

students would have liked to remain at the school indefinitely, this was not possible because authorities provided funds for stipulated periods of time. After-care was considered to be a major problem.

Colligan reported that a separate educational establishment, Condover Hall, had been created in 1947 in Britain to educate deaf-blind children. In the six years prior to the publication of Colligan's paper, 12 deaf-blind children had been returned to their local schools. Re-entry into regular education was one of the possible outcomes of this program. The institutional program focused upon maximizing independence. Consequently, stress was laid on such areas as Braille, typewriting, handicrafts and occupational skills. As described, the program had a rehabilitation orientation promoting preparation for employment through developing residual sight and hearing, providing an adequate method of communication and community education. Deaf-blind graduates were placed in industry in certain instances. Others entered general sheltered workshops or residential centers for deaf-blind persons. The latter type of institution encouraged participation in handicrafts. Colligan felt that both the community and the individual gained from this type of program.

A number of authors have described educational programs for deaf-blind children at individual schools. For example, Burns and Stenquist (1960) presented the Perkins School program in some detail, as did Lowenfeld (1952) for the California School for the Blind, and Krohn (1956) for the Iowa School for the Deaf. An earlier review of the national picture was offered by Mack (1929) who reported that, at that time, 30 deaf-blind children were receiving an education. A number of others were believed to be living at home or at institutions for the mentally retarded. As a result of this survey, Mack offered two recommendations: (1) the formation of a central national organization for the deaf-blind and (2) the development of a national school for deaf-blind children who were not acceptable at schools then serving deaf-blind children.

Sister Justina (1953) surveyed Catholic deaf-blind children in the United States. She found 45 deaf-blind pupils of all faiths attending eight different institutions. Forty-two of these 45 children were in public schools or public institutions; three were enrolled in Catholic institutions. Twelve children in all were known to be Catholics (nine were attending public schools or institutions; three were attending Catholic institutions). The nine Catholic children attending public facilities were reported to be receiving religious instruction. St. Mary's in Buffalo was reported in Sister Justina's paper to be the only Catholic institution in the United States serving totally deaf and totally blind children, although the De Paul Institute was educating two children with severe visual and aural losses. The author estimated that about 75 per cent of all deaf-blind children were not currently being educated in special facilities for the deaf or the blind.

Dinsmore (1954) discussed the educational concerns of the National Study Committee on the Education of Deaf-Blind Children. An acute shortage of teachers of deaf-blind children led to the organization of experimental summer training courses developed jointly by the Perkins School for the Blind and Michigan State College. Although two of the graduates of this teacher-training program opened new departments for deaf-blind children, the trickle of graduates was too small to have a material impact upon the problem. As a consequence, the Watertown Conference (Perkins School for the Blind (1954), reviewed current knowledge about deaf-blind children and resulted in the formation of



the National Study Committee on the Education of Deaf-Blind Children (1954). In turn, the Committee proposed a national research center and regional facilities for deaf-blind children. Operating under standards set by the national center, the regional facilities would exchange information and function in a coordinated manner. This proposal has not yet been implemented.

Burns and Stenquist (1960), in a comprehensive reveiw of educational programs for deaf-blind individuals, quoted statistics of the American Foundation for the Blind suggesting that there were 372 known deaf-blind children under the age of 20 in the United States. One-third to one-fourth of these children were considered to be totally deafandtotally blind. Forty per cent were thought to have at least one other physical disability. The 372 children were distributed as follows:

|                                                                |     |
|----------------------------------------------------------------|-----|
| At home. . . . .                                               | 190 |
| Being educated in departments for deaf-blind children. . . . . | 87  |
| In institutions for the mentally retarded . . . . .            | 74  |
| Attending nursery schools or in tutorial situations . . . . .  | 21  |

A survey of schools with departments for deaf-blind children elicited the following information about their students:

1. A majority of the deaf-blind children enrolled were visually handicapped deaf children who could not be educated adequately in programs for the deaf.
2. The number of deaf-blind pupils per teacher ranged from two to four.
3. All the schools used the vibration method of teaching children to speak and understand speech.
4. In most schools, the deaf-blind pupils were integrated with deaf students or blind students in some subjects. Complete integration was achieved in three schools: California, Iowa and Perkins.
5. Three schools have undertaken teacher-training programs: Alabama, Michigan and Perkins.
6. Four of the schools accepted out-of-state pupils.
7. Five schools had a minimum age (4 1/2 to 6 years).
8. Six of the eight schools were financed by state per capita payments; the other two received state supplements.
9. The schools responding to the questionnaire indicated their major problems. These included: securing qualified teachers, the lack of diagnostic instruments to determine educability, the education of multiply handicapped children, the lack of dormitory and classroom facilities, the lack of contact with parents, and the lack of facilities for children found to be uneducable.

Reference to Anne Sullivan's correspondence concerning her teaching experience with Helen Keller reveals some surprisingly modern insights into general teaching principles. Apparently, this extraordinary teacher arrived at approaches which were not generally accepted by educators for all children until well into the Twentieth Century. At a later date, Barnes (1931) established the principle that deaf-blind children should not be considered untrainable until they had had a trial in an institution under expert instruction. Hall (1940) felt that instruction in Braille for deaf-blind children should be preceded by two years of sense training and spoken vocabulary building.

Myklebust (1956) laid down some general teaching principles for deaf-blind children based upon his concepts of differential diagnosis:

1. Training should be oriented to the nature of the sensory deprivation. The tactual sense should be reinforced for foreground activity; the olfactory for background or scanning activity.
2. Provide continuous meaningful contact and stimulation through preventing isolation, developing meanings through a readiness program, and promote fullest use of the remaining senses.
3. Encourage motor activities which aid learning and bring about pleasurable experiences.
4. Training in social maturity should be an integral element in the educational program.
5. Training in language is a fundamental step in the education of deaf-blind children. This training should follow a sequence of inner language, receptive language, and finally, expressive language. As a basic principle, experiences and meanings should precede the learning of symbols.

Meshcheriakov (1962) laid down basic concepts for teaching the deaf-blind child. Normal children develop almost imperceptibly, but deaf-blind children develop in accordance with the pedagogical process. Even with great potential, the deaf-blind child will attain only the lowest levels of mental development through his own efforts. Through two to four years of tremendous labor on the part of the deaf-blind child and his teacher, direct images are formed and accumulated and habits of human conduct are developed. This humanizing foundation can function usefully even without speech.

As a first step, the child should model plasticine to communicate his images and inner life. Then, the child is taught specific gestures with his hands (manual speech) to represent objects. Individual letters of the alphabet are introduced only after the child has mastered a number of words standing for objects. When the child can combine letters into words with facility and can read words spelled into his hand by his teacher, Braille and grammatical structure should be introduced.

The Royal National Institute for the Blind (1962) reported some of the findings of a conference on teaching the deaf-blind child. The education process indicates that the multiformity of human mentality and behavior is a product of social intercourse. Many deaf-blind children, having focused earlier upon



meeting physical needs have lacked sufficient contact with the environment. In the developmental process, objects become separated from physical need. As a result, orientative and investigative activity become emancipated and independent, and stimulate secondary needs for getting to know the outside world. Initial humanization occurs as the deaf-blind child, in learning about unfamiliar objects, also learns their purpose.

At the beginning, the child has to familiarize himself with the whole object. In a second encounter with the object, he needs to perceive only a part of the object. Thus, investigating with his hands (assisted by other senses,) the child establishes connections which become signals of the images of the object. Later, alternative stimuli signal the same images. Through constant perception of the world, the child forms and re-forms, systematizes and resystematizes the images. At the highest stage of development, the signals of the images are words.

The most definitive work in formalizing teaching methods for deaf-blind children was performed by Robbins (1960). She felt that, although the development pattern of deaf-blind children is similar to that of non-handicapped children, the techniques and the timetable are vastly different. Robbins suggested a program of diagnostic readiness including a team evaluation of educational potential, a trial year, classification as educable or trainable based upon anticipated level of social competence, and placement in a program consistent with the diagnostic findings. Within two years of its initiation, a readiness program may attain the following goals:

1. self-care
2. motor development, including hand coordination and some travel competence.
3. social awareness, including recognition of people, cooperativeness, desire to imitate, some spontaneous play, enjoyment of interaction with adults.
4. Language development, including responding to direction and attempts to communicate.
5. Intellectual development, including the ability to direct attention, remember simple things, solve simple life problems, maintain curiosity, engage in self-occupation, and to begin to use senses other than the dominant one in perception.

These goals are attained through a consistency of approach, building satisfying social relationships, extending the quality and quantity of experience, motivation based upon useful activity that is understood by the child, and contact with, and instruction of, parents. Through rapport with the teacher, the deaf-blind child learns to place trust and confidence in him, and thus experiences affection, success, acceptance, approval and freedom. Until a firm relationship is established, little can be asked of the child. As the relationship grows, the child permits the teacher to guide him and to widen his social and physical environment. In the beginning, satisfaction flows primarily from the relationship. Subsequently, satisfaction and approval will derive from the activity.

Robbins suggested the following general principles:

1. Know the natural sequence of growth in the child and do not expect performance beyond his maturational limits.
2. Without motivation, there will be no learning.
3. The child will learn through active participation and interaction not through passive means.
4. Since the child will feel the teacher's mood, teacher zest and enthusiasm are vital to the learning process.
5. Deaf-blind children differ from each other. Therefore, try to understand this child as an individual with unique constitutional and environmental factors.
6. Plan in accordance with both short- and long-range goals.
7. New materials should be introduced very slowly.
8. Set behavioral limits for the child as this will help him to define the environment. This should be done in as positive a manner as possible.
9. Before demanding a given response, provide ample opportunity for it to be learned.

Robbins offered guidelines for teaching the deaf-blind child, including: meaningful activity (drawn from real life wherever possible), maximum self-direction with teacher guidance, stress on positive behavior (re-directing negative behavior when needed), repetition of the same material in different contexts, consistency in approach, provision of a general framework that is not regimented but which provides security and organization, structuring of learning experiences so that the child can attend to the essential elements, and persistence in trying to obtain the desired response more than once or twice, if necessary.

The development of personal social behavior was discussed by Robbins at some length. Teaching activities should center upon self-care (dressing, washing, and eating), social awareness (starting with self-concept and relationship with the teacher and, then, moving on to group interaction), play (through experience with a number of toys and other objects and through freedom to experiment), motor development, and adaptive or intellectual behavior (tactual, auditory, visual, and olfactory).

Robbins advocated the development of inner language through which a fund of impressions is collected and meaning and order are assigned to things and events in the world, receptive language through the verbal and non-verbal behavior of others is understood, and expressive language through which vocalizations, gestures and movements are used to communicate with others.

In all these teaching-learning activities, a balance between helping the child and fostering independence must be achieved in order to promote creative growth and problem-solving ability. Art materials are especially useful in this



connection since they tend to objectify his experiences, provide an emotional outlet, foster self-confidence, independence and satisfaction, encourage kinesthetic activity, and provide an awareness of self and bodily feelings.

The literature of teaching methods tends to be more comprehensive than that in other areas of education and rehabilitation. It suggests that the accumulated experience of teachers of deaf-blind children (especially as distilled by Robbins) is sufficiently objective and practical to warrant incorporation into training programs for teachers of deaf-blind children. Although we need even more scientific and functional data concerning teaching techniques, our major educational problem seems to lie in recruiting and training educators and others, who have the potential to develop into professional workers with the special skills needed to work with deaf-blind children.

## Rehabilitation

The rehabilitation of deaf-blind adults constitutes a problem quite different from that of educating deaf-blind children. With few exceptions, deaf-blind adults are individuals who passed through their formative years with only one of the two major disabilities. Unlike deaf-blind children, these individuals were educated either as deaf or blind persons, and in the course of adolescence or their adult years had to adapt to the double disability. Thus, their education was relatively conventional. If they were deaf in childhood, they received the educational services customarily accorded to deaf students, and if they were blind they received the educational services customarily accorded to blind students. However, the onset of the second disability disrupted the prevailing response pattern. Thus, the second loss precipitates both physical and emotional needs for new adaptive patterns. The development of these new patterns in adult life constitutes one of the significant challenges to the deaf-blind person and to those interested in his rehabilitation.

Deaf-blindness introduces a social deterrent which effectively isolates the person from the human contact which is so essential to his rehabilitation. An almost impermeable membrane grows up between the deaf-blind individual and the social environment at a time when the deaf-blind person needs social interaction the most. Mary E. Switzer (Proceedings A. A. W. B. 1958) stated that the deaf-blind person fears that he is on the fringe of society, a status from which escape seems very difficult. For his part, the professional worker with the deaf-blind also expresses fear, but his fear is that of professional inadequacy because he is required to function without guideposts and tools. Miss Switzer felt that mutual trust, friendliness, and interest can help to allay the fears shared by the two participants in the rehabilitation process. In this respect, the professional worker needs the support of a body of knowledge and experience to guide him in serving the deaf-blind person. The most comprehensive material of this type may be found in the IHB Project on the Rehabilitation of Deaf-Blind Persons (Industrial Home for the Blind 1958).

Rsualet (1959) in summarizing the data derived from a study of a sample of deaf-blind adults arrived at the following conclusions:

1. A specialized vocational program seems indicated for many deaf-blind persons. The evidence suggested that vocational programs established primarily for those with other disabilities had limited value for the deaf-blind person with multiple problems.

2. The findings clearly demonstrated the employability of many deaf-blind persons in sheltered employment.

3. Some clients can be served by vocational rehabilitation programs which do not offer specialized services for deaf-blind persons. This alternative is most feasible for deaf-blind persons who have mobility, communicate readily, and are in otherwise sound physical and emotional health. Only a minority of deaf-blind adults have these qualifications.

4. Placement in competitive industry is possible for some deaf-blind persons, particularly those retaining considerable vision, having good mobility and personality integration, and possessing occupational skills and good social awareness.

5. Placement in competitive industry continues to lag even for the most promising deaf-blind candidates because of fearfulness of professional workers, lack of acceptance of industry, and limited professional experience in developing such placements.

6. The employability of deaf-blind persons is interwoven with non-vocational factors such as physical capacities, social competence and mental health. Consequently, vocational rehabilitation of the deaf-blind functions best as an interdisciplinary team effort.

In some respects, the British have led the way in the rehabilitation of deaf-blind persons. Eicholz (1932) estimated that 2,803 deaf-blind persons resided in England and Wales at the time of writing. Incidence increased with age. Thus, the highest frequency of cases was in the age range 70 to 80 years. Constituting some five percent of the total blind population, the deaf-blind group tended to be neither totally blind nor totally deaf. The large majority of them were considered to be unemployable owing to the fact that 80 percent of the group was 50 years of age and over. Yet, Eicholz felt that with training many more could become employable.

Most of these deaf-blind persons preferred to remain in their homes rather than enter special residences for deaf-blind individuals. Those who remained at home had need for volunteer workers to serve as companions and friends. The then current program for deaf-blind persons included: instruction in manual communication; financial assistance, if needed; improvement of home surroundings; training for useful work, if possible; pastimes taught by home teachers; weekly visits by volunteers; referral to missions for the deaf for spiritual, social and recreational services; library and magazine services; social gatherings (with transportation provided); summer holidays; gifts, and religious visits and materials. Although successful placement in industry was the goal, this was the area in which the greatest need currently existed. Despite the lacks reported by Eicholz, the program described was an enlightened one for those days.

In a follow-up article one year later, Eicholz (1933) reported that 10 percent of the 2,760 deaf-blind persons over 21 years of age in England and Wales were employed. A total of 87 percent were unemployable with one percent in each of the following three categories: trained and unemployed, in training, and trainable but not in training. Eicholz felt that many of the members of the unemployable group could have achieved employment if their situations had been recognized and remedied earlier.



A few deaf-blind persons in Britain have expressed their feelings about rehabilitation services for members of their group. Brown (1945) noted that, if stricken with the double disability in adult life, the deaf-blind person should be given every opportunity to continue in his customary occupation at the same rate of remuneration. If retraining is necessary, it should be in a trade which requires skill. Brown suggested that few home teachers understand deaf-blind persons. Finally, he observed that agencies for the deaf do less for the deaf-blind than agencies for the blind. Merlyn (1944), another deaf-blind person, indicated that the deaf-blind should take the initiative in putting others at their ease and in developing friendships.

In a subsequent article, Merlyn (1946) suggested that newly deaf-blind persons must have a rehabilitation incentive. An important incentive is the interest of others in the community who will guide him, encourage sighted and hearing persons to talk to him, and help him to make social contacts. Merlyn believed that stubbornness and aggressiveness are potentially positive traits in deaf-blind persons that can be molded into rehabilitation assets. Since others in the community may not be expected to learn a new communication system, it is important for deaf-blind persons to gain proficiency in reading capital letters. Merlyn (1951), in a third article, advised deaf-blind persons to attain maximum independence, even if this exposes them to criticism. He suggested that real contact with the outside world cannot be achieved through total dependence upon an interpreter and urged deaf-blind individuals to learn the vibration method.

Lowe (1951) reported on the program of Tate House, a residence that accommodates 26 older deaf-blind persons on a long-term basis. Even at this age level, the program had a rehabilitative flavor including such activities as: basketry, hand looming, rug-making, chair caning, stool seating, raffia work, knitting, crocheting and leather work. Through participation in a busy life, the residents were helped to attain maximum independence. Getliff (1952) described measures which should be taken when placing a deaf-blind person in a residence environment. He felt that the manual alphabet should be taught to others in the residence, extra staffing should be provided so that individual attention can be given to the deaf-blind person for at least one hour a day, home teachers should visit the residence to teach crafts and communication, and encouragement should be given to deaf-blind persons to join the Deaf-Blind Helpers League.

Dauncey (1952) reported on the training and employment of a young English deaf-blind girl as a machine tool operator. This girl had been trained and employed on a relatively simple manual job. Within several months, her performance was well above average, resulting in her transfer to a more complex job which required 12 different movements for each machine operation. The success of this placement was made possible by the skill of the deaf-blind person, the interest of the foreman, the assistance of a blind worker and the positive attitude of the employer. This deaf-blind employee is regarded not only as productive, but as having a good influence on other workers in the plant.

Colligan (1954), discussing rehabilitation services for deaf-blind persons in England, suggested the development of residual sight and hearing, training in proficient use of an adequate method of communication with the outside world, and the mobilization of goodwill among employers, especially those who already have had favorable experiences with blind workers.

Although much of the work and the consequent writing concerning deaf-blind adults in the United States has been performed at the Industrial Home for the Blind, others have indicated an interest in this group. Bryan (1949) felt that

the defeatist attitude of some professional workers serves as a barrier to the vocational development of deaf-blind persons. The professional worker in the vocational area, in addition to the usual competencies required in this field, needs to be able to educate employers about the capacities of deaf-blind persons and to be sensitive to the impact of possible failure upon the client. Home teachers have a role to play in helping to develop techniques and habits in the deaf-blind person that can be useful on the job. As the client demonstrates readiness for vocational planning, the home teacher should refer him for vocational rehabilitation. Even after the referral has been made, the home teacher should maintain contact with the rehabilitation personnel, assisting them to understand the deaf-blind client. Employment possibilities should not be limited to jobs in competitive industry. In selected instances, small business enterprises or industrial homework may be preferred alternatives.

In 1955 (A. A. W. B. 1956), the American Foundation for the Blind sponsored a workshop to consider vocational possibilities for deaf-blind persons. At that time, the vocational problems of the group were analyzed in detail. Although the group was hopeful, it was noted that deaf-blind persons were still considered unfeasible for vocational rehabilitation in many instances.

Burns and Stenquist (1960) reviewed the contributions of The Industrial Home for the Blind in relation to the vocational rehabilitation of deaf-blind persons. They made the point that education often serves as the basic foundation of subsequent rehabilitation experiences. They urged the adoption of an educational program which will increase client readiness for rehabilitation service. The process should begin with early diagnosis and parent counseling. The school years should serve as a training ground in such areas as self-care, independence, communication, work habits and attitudes, and work abilities and techniques. During the transition from school to rehabilitation service, school records should be opened to the rehabilitation worker and the teacher should assist in the transition, maintaining contact with rehabilitation personnel. The goal of rehabilitation was well defined by Helen Keller as "the dignity of self-support and the joy of usefulness."

Waterhouse (1957) felt that in deaf-blindness the resulting compound disability is different from and greater than the sum of the component disabilities. Few deaf-blind graduates of education programs are as outstanding as Helen Keller or Robert Smithdas. In most cases, deaf-blind persons do not have the favorable constellation of outstanding manual ability, good communication skills and an almost unlimited determination to succeed. As a consequence, it should be recognized that deaf-blind graduates may need sheltered employment or even custodial care. In any employment situation, the deaf-blind worker should be placed near other workers and under supervisors who will provide him with an ongoing social contact and satisfying recreation.

Keane (1949) indicated that The Industrial Home for the Blind, at that time, had 21 deaf-blind men engaged in workshop tasks. An important problem in developing a workshop program was that of transportation. As one solution to the problem, the IHB maintains a residence convenient to the workshop, enabling some deaf-blind individuals to live nearby. Owing to the size of this deaf-blind sample, it was possible for the IHB to assign a full-time person to coordinate the service program for the group.

Salmon and Rusalem (1959) described the procedures used at the IHB in providing vocational rehabilitation to deaf-blind persons. Basic teaching principles applied to the vocational situation were spelled out as follows:



1. Orient the deaf-blind person to the whole task.
2. Use demonstration methods to introduce him to the various elements of the job.
3. Move from the simple to the complex.
4. Break up the job into manageable elements and teach them as interrelated job tasks.
5. Teach the job in a real work setting.
6. During early training, supervision should be continual. Gradually lessen supervision as the client progresses.
7. Be prepared for a longer than usual training period in some cases.
8. Continue social casework and counseling service during vocational training, if needed.
9. Terminate training when the client has attained a level of efficiency considered the minimum for the type of employment for which he is preparing.
10. Maintain complete training records.
11. At the termination of training, the client should be capable of adjusting to the work conditions he will have to face in his first post-training work experience.

Salmon and Rusalem concluded their survey of the vocational rehabilitation process with deaf-blind persons by making the following general observations:

1. Too few deaf-blind persons are being reached by the vocational services of community agencies.
2. Even where a specialized agency is available there is good reason to believe that existing agencies could be more extensively used for the deaf-blind, including such facilities as vocational counseling agencies, local workshops for the disabled, and community training facilities.
3. There is a current need for the development of more regional rehabilitation centers for the deaf-blind.
4. A greater proportion of sheltered workshop facilities should be made accessible to the deaf-blind.
5. Communication remains the fundamental problem of the deaf-blind.
6. Because deaf-blind persons are distributed throughout the country and may be found in any community, there is a need for all

vocational workers, especially those who specialize in work with the blind, to be familiar with the problems of deaf-blindness.

7. Both generalists and specialists require pre-service and in-service training in the area of deaf-blindness.

In 1962, the IHB, in cooperation with the Vocational Rehabilitation Administration, undertook the first regional rehabilitation service for deaf-blind persons serving the Eastern seaboard down to North Carolina, Regions I, II, and III of the U. S. Department of Health, Education, and Welfare. This project is demonstrating that a regional service of this type can make a substantial contribution to the rehabilitation of deaf-blind individuals. The preliminary results are promising.

An important feature of this project is the resettlement aspect. Since June 1962, the IHB has employed a field staff as part of the Project Rehabilitation Team which surveys a community, assesses the deaf-blind person, and develops liaison with community agencies prior to the arrival of the client in New York City for rehabilitation diagnosis and training. The purpose of these field activities and those which are carried on during and subsequent to training is to assist the individual to return to his home community and to find there a climate of acceptance and suitable social and vocational opportunities.

At this writing, the data relating to this project appears in Progress Reports submitted to the Vocational Rehabilitation Administration and in a paper by Bettica and Newton (1965). A preliminary survey of the first 100 cases served by the project revealed that the large majority of these deaf-blind clients were in employment, were functioning successfully as homemakers, or were in advanced training in fulfillment of the rehabilitation plan. The initial results of this endeavor are sufficiently favorable to justify the establishment of additional regional centers for deaf-blind persons throughout the United States. The current disinclination of agencies to undertake this type of enterprise suggests that a national center may be the ultimate solution. However, decisions concerning this possibility have not yet been made. Finally, the IHB project has conducted several interesting correlated research efforts in the areas of attitudes, communication, cognitive abilities and training. These will be reported at a subsequent date.

A unique project was undertaken by Rusalem (1959) to study the functioning of deaf-blind homemakers. The major findings of this study were:

1. Despite deaf-blindness, the women in this group were functioning satisfactorily as homemakers.

2. Some areas of homemaking seem to fall clearly within the capacities of most deaf-blind homemakers. These include: shopping, care of clothing, preparation of meals, decorating and entertaining. Less independent action was observed in the areas of money management and child care.

3. Residual useful vision has a powerful bearing on the degree of independence possible for a deaf-blind woman in her household duties.



4. Assistance from a seeing person is often crucial to the home-making success of a deaf-blind person.

5. In this study, virtually no instances were recorded of deaf-blind women using special devices in their homemaking activities.

6. Deaf-blindness is only one dynamic in the adjustment of these deaf-blind women. Some of the members of the group had clear advantages in terms of residual vision, educational opportunities, socioeconomic status, assistance available from seeing persons, and companionship. Yet, the crucial factor which seemed to overshadow all was the fundamental personality structure of the individual deaf-blind homemaker.

The American materials relating to the rehabilitation of deaf-blind adults are limited in that so much of the "hard" data emanates from a single agency program. As a consequence, the findings reported and the techniques used may reflect too heavily one orientation in the field. Yet, the reality of the situation is that, as of this writing, no other source of large-scale experience is available. The Industrial Home for the Blind has pioneered in many areas of rehabilitation service for the deaf-blind but no single agency can meet this challenge alone. Progress in this field may well depend upon the willingness of other agencies to develop larger-scale rehabilitation services for deaf-blind persons residing in their areas.

The agency or agencies which generate such an interest will have many rewards, not the least of which is the gratification that seems to be associated with service to this group. But, beyond the promise of satisfaction, prospective programs have reality prospects as well. The Industrial Home for the Blind stands ready to assist qualified agencies desiring to undertake rehabilitation programs for deaf-blind persons by making available to them know-how, consultation, instruction and research. Indeed, such agencies may be assisted to acquire funds to embark upon demonstration and/or research projects in this area. Until now, the development of rehabilitation services for deaf-blind individuals has been retarded by the disinclination of other organizations to enter this field. As a consequence, deaf-blind persons living outside the IHB region usually have fewer services available to them than those in the region. This inequity cannot long endure.

### Interpersonal Relationships

A recurring theme in the literature of deaf-blindness is the crucial significance of the deaf-blind person's human relationships. Despite the acknowledged importance of this variable, data relating to it is exceedingly sparse. The only experiment in the human relationship area was reported by Bettica (1966). A questionnaire concerning reactions to deaf-blind clients was answered by 50 professional workers employed by The Industrial Home for the Blind. Each of these workers had been required to engage in professional service to many deaf-blind individuals in the course of their agency activities with both blind and deaf-blind clients. The major findings were:

1. There was an initial reluctance to engage in conversation with with a deaf-blind client.

2. Initial difficulty in communication was virtually universal in the worker group.

3. Although some problems persisted after the initial contact, in time communication became increasingly comfortable.

4. These professional workers had had little exposure to the literature concerning deaf-blindness prior to their employment at the IHB.

5. Even in cases where there had been a prior acquaintance with the literature, this was not a practical help in subsequent professional contacts with deaf-blind clients.

6. At the time that these workers began serving deaf-blind clients, they often had a sense of hopelessness, futility, uncertainty, fear and inadequacy related to deaf-blind persons.

7. Such attitudes prevented these workers from using their professional skills fully.

8. In time, these professional workers, especially those who interacted with deaf-blind persons without using an interpreter, developed more accepting attitudes and, consequently, were able to make better use of their professional skills.

Bettica and Rusalem offered the following recommendations:

1. Workers entering an agency for the blind with the prospect of serving deaf-blind persons should be helped to overcome initial resistance to this client group through a planned orientation program.

2. Prior to meeting his first deaf-blind client, the new worker should be equipped with communication skills, a body of specialized knowledge about the problems and potentialities of deaf-blind persons, and an awareness of their own feelings about deaf-blindness.

Kinney (1956) offered down-to-earth suggestions for professional workers seeking to develop a relationship with deaf-blind clients. He felt that the professional worker is "doubly handicapped" in forming such a relationship since the client cannot respond to the appearance or speech of the worker. His suggestions include:

1. Choose a special signal through which to initiate and terminate contacts with deaf-blind persons.

2. Whatever the means of communication used, the hands must express the emotion, warmth and reaction that are usually expressed by the voice and the face.

3. When in a group situation with a deaf-blind person, cue him in from time to time about what is happening. Furthermore, offer him opportunities to contribute to the situation.

Le Play (1947) stressed the attitudinal component in relationships with deaf-blind persons and offered the following suggestions relating thereto:



1. If the sighted individual can realize what the loss of sight and hearing would mean to him, he will feel "honored" to serve deaf-blind persons when the opportunity arises.

2. As a manifestation of a respect for the rights and personality of the deaf-blind person, meet them on equal terms and invite their cooperation.

3. Since deaf-blind persons must place heavy reliance upon those around them, misleading information of any type should be avoided since they will discover this in time and will lose confidence. Deaf-blind persons have a right to know the realities of life, to give and receive sympathy, and to give service when needed.

Cripps (1937) considered the relationship problem from the view-point of a sight and hearing companion. Contrary to the prevailing belief that constant association with deaf-blind persons involves considerable physical and nervous strain, the author, after four years of service as a companion to a deaf-blind individual, felt that no such strain is necessary. In her experience, she found no difficulty in accompanying a deaf-blind person on walks, engaging in communication, or participating in activities. She developed a genuine and deep friendship with the deaf-blind person through which the two shared joys, difficulties and intimate problems.

Chermak (A. A. W. B. 1960) discussed the relationship between deaf-blind persons and the magazine "Touch and Go." It is felt that this publication encourages social relationships for deaf-blind persons in that it provides them with interesting conversational topics. In an unpublished study, Rusalem (1964) reported on a program conducted in a residence for older blind and deaf-blind persons to encourage interaction between the two groups. The technique used was instruction in print-in-the-palm for both blind and deaf-blind older persons, plus planned social events integrating members of both groups. After the leadership services of the professional worker were withdrawn at the end of the summer program, interaction between the blind and deaf-blind older residents continued to flourish for almost a month. Subsequently, however, contacts between members of the two groups declined gradually until the pre-experimental state prevailed again. In discussing the reasons for this phenomenon, the older hearing blind persons stated that deaf-blind persons were not sufficiently "interesting" to merit continuing contacts on a spontaneous friendship level. Rusalem concluded that there is a need for further experiments in this area with different groups and for longer periods of time.

Three items in the literature concern the recreation experiences of deaf-blind persons with particular reference to group interaction. Taylor (1935), after reviewing types of recreational activities for deaf-blind persons, suggested that group relationships would be facilitated if all children in the public schools were taught the manual alphabet, Miller and Barr (1959), in the course of observations of deaf-blind clients in the IHB recreation and group work program, arrived at the following conclusions:

1. Recreation is an essential life experience for deaf-blind persons as it is for all persons.

2. Despite real difficulties, it is possible to provide a rich group experience for individuals who cannot hear and are legally blind.

3. Good principles of group work and recreation are equally applicable to the deaf-blind as to other groups. However, recreation personnel must take into account the special characteristics and needs of deaf-blind persons in planning programs for them.

Verstrate (1959), in an analysis of the groupwork process at the IHB, found four types of participants: (1) leaders, a group which had the least resistance to new activities and related well to most of the group; (2) a transitional group composed of those beginning to establish a position in the group and expressing eagerness for new experiences; (3) followers who never initiate activity and whose social contacts depend upon others reaching out to them; and (4) a very withdrawn group which rejects contact and, despite attendance at some activities, resists involvement.

Within five months after the beginning of her professional service to the group, Verstrate achieved acceptance as a professional person. In time, the deaf-blind participants became more independent in their activities, revealing a greater readiness to do more for themselves without the help of volunteers. Within this group framework, the greatest progress was achieved by members of the transitional group and the withdrawn group.

The success of a group was directly related to the development of communication within the group and the presence of trained adequate volunteers. A group work program with deaf-blind persons rests heavily upon a recognition of the individuality of the members. The only commonality that may be assumed is the presence of the double disability. Verstrate concluded that there is no stereotyped attitudes toward the deaf-blind as there is toward the blind because so little is known by the average person about them. In a sense, the development of a stereotyped attitude toward deaf-blind persons would indicate progress since, at least, this would represent awareness.

A number of authors have suggested that the attitudes of seeing and hearing persons play a vital role in determining the quantity and quality of the human relationships experienced by deaf-blind persons. A number of attitude studies are being conducted at The Industrial Home for the Blind in connection with the Anne Sullivan Macy Service for Deaf-Blind Persons (the IHB regional rehabilitation service.) Although most of the data has not yet appeared in print, the evidence strongly suggests that public attitudes toward deaf-blind persons are even more extreme than those relating to blind persons, with heavy overtones of hopelessness, despair and avoidance.

Two of the IHB attitude studies have been published. In the first, Rusalem (1965), in a survey of college students' beliefs about deaf-blindness, found that in a sample of 132 freshmen enrolled at Long Island University in Brooklyn, N.Y., student contact with deaf-blind persons was minimal. None had ever entertained a deaf-blind person at home. More than 99 percent had never attended a social function at which a deaf-blind person was present. Ninety-seven percent had never helped a deaf-blind person. Eighty-two percent had never seen a deaf-blind person.

In response to an adjective check list, these students indicated the characteristics which they associated with deaf-blind persons. The adjectives checked most frequently were: dependent, grateful, gentle, friendly, self-controlled, pleasant, depressed, slow, calm and submissive. The adjectives checked least frequently were: mean, stingy, rough, ungrateful, unpleasant, impulsive,



attractive, successful, humorless and boorish. The adjectives most often used to describe deaf-blind persons seemed to fall into three major clusters:

1. A dependency cluster.
2. An ingratiation cluster.
3. An inhibition cluster.

Rusalem concluded that these students perceived deaf-blind persons as dependent, ingratiating, inhibited, socially conforming and unsuccessful. In evaluating the abilities of deaf-blind individuals, these students were generally realistic. Unreality seemed more prominent in their expectation that deaf-blind persons are unhappy, envious of those who see and hear, and devoted to religion. Perhaps the most revealing finding was the widespread belief in this student group that those who see and hear really do not want to associate with a deaf-blind person. Rusalem suggested that these misconceptions result primarily from a lack of contact with deaf-blind persons.

There have been few attempts to modify public attitudes in an organized way. Current experiments at the IHB aimed at changing the attitudes of high school students, clerical workers, salesmen, engineers, graduate students in rehabilitation counseling and nurse trainees will be reported in detail after this review appears. However, one such experiment has already been published. Rusalem and Rusalem (1964) observed the impact of a deaf-blind speaker at a school assembly upon the beliefs of secondary students. Prior to the appearance of the deaf-blind speaker, 91.4 percent of the 395 high school students had strongly negative, moderately negative, or mildly negative percepts of deaf-blindness. The large preponderance of these (78.7 percent) were strongly negative. After listening to the deaf-blind assembly speaker, 335 (67.0 percent) of these students had changed perceptions and in all but two instances, these were in a positive direction. On the whole, there was a greater awareness on the part of the student group of the capacities of deaf-blind persons.

Even in this brief and tenuous contact with a deaf-blind person, the group reported learning the following:

1. Deaf-blind persons have abilities and can become relatively independent.
2. In general, people can overcome their handicaps.
3. Deaf-blind persons can communicate with others.
4. Deaf-blind individuals can solve many of the problems arising in their daily lives.
5. The assembly speaker has accomplished a great deal.
6. Help is available in the community for deaf-blind people.

The females in this study were more accepting of deaf-blind persons than the males. This was particularly true in relation to inviting a deaf-blind person into one's home and working on a school project with a deaf-blind person.

However, only 28.1 percent of all the girls and 21.6 percent of all the boys would date a deaf-blind person. The authors suggested that although there was no evidence of a long-range effect on the attitudes of these students, the assembly experience produced a readiness for additional experiences with deaf-blind persons. Had such additional experiences been available, it would have been possible to assess the long-term impact of this brief assembly program upon students' beliefs. This study pointed up the need for an intensive campaign of community education regarding deaf-blindness.

The available data concerning interpersonal factors indicates that deaf-blind persons and others can develop friendship bonds, group association and professional relationships. In each instance, the non-disabled individual is required to extend himself in the relationship, often having to take the initiative in the early stages. Since seeing and hearing persons tend to avoid relationships which require unusual effort or adjustment, there is a tendency to avoid the deaf-blind person. Consequently, those embarking upon new relationships with deaf-blind persons require systematic preparation. Without initial orientation and assistance, some well-meaning and sincere sighted persons may feel defeated in their first attempts to relate to deaf-blind persons and, as a result, may withdraw from further contacts with them.

It seems clear from the data presented in this paper that such relationships cannot be left to chance. Agencies for the blind endeavoring to serve deaf-blind individuals must offer pre-contact training and subsequent supervision and counseling to sighted persons, lay and professional, entering upon interpersonal relationships with deaf-blind individuals. With this assistance, professional and social contacts will become increasingly comfortable and gratifying to both participants.

### Final Observations

This review of the literature of deaf-blindness has focused primarily upon the past, bringing to the readers' attention the recorded thoughts of those interested in deaf-blind persons. If a similar review should appear ten years hence, it may be quite different. Although the change is coming about gradually, perhaps too slowly for those impatient to see marked social advances in this area, the door is opening perceptibly for deaf-blind persons. In 1965, deaf-blind individuals had more opportunities for self-development than ever before in human history. If expected changes actually occur in the next decade, the work of 1966 will seem almost primitive in 1976. By then, we hope to see the following take place:

1. Almost all the deaf-blind persons in the United States will have been identified, evaluated and classified. A group in special need of case-finding during the next decade will be deaf-blind persons who are confined unnecessarily in institutions for the mentally retarded and emotionally disturbed, and in nursing homes for the aged.

2. Depending upon their needs and desires, most will be receiving suitable rehabilitation services. In view of the current inability of organized service to blind persons to develop regional services, the deaf-blind person of 1976 probably will receive rehabilitation service from a national center for the deaf-blind.



3. The goal of such national rehabilitation center services will be to assist the individual to turn to and enjoy the ongoing life of his home community.

4. Progress will be made toward creating a more favorable attitudinal climate for deaf-blind persons in local communities, states and on the national scene.

5. Improved vocational rehabilitation techniques will enable an increasing proportion of deaf-blind persons to find employment in industry.

6. Major steps forward will take place in communication enabling blind, deaf-blind and sighted persons to relate more easily to each other.

7. Research will be accelerated in every phase of deaf-blindness and will provide improved guidelines for everyday practice with this group.

8. A new interest will be generated in the mental health of deaf-blind persons and initial attempts will be made to provide prevention and treatment services.

9. Technological advances will create new devices helpful to deaf-blind persons, such as travel aids, improved doorbells and communication instruments.

10. Training programs for those entering professional service to deaf-blind persons will be developed.

As with all projections into the future, these ten ideas are more in the nature of hopes than expectations. Yet, the feeling one gets in 1966, the centennial year of Anne Sullivan's birth, is one of movement and progress.

Spurred by the centennial activities sponsored by Perkins and the IHB, what is hope in 1966 may well be expectation in 1970 and reality in 1976. The reviewer of 1976 will have an opportunity to test the predictions offered in this paper. Deaf-blind persons will be fortunate, indeed, if many of them come true.

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# OUR MARK TWAIN

By Helen Keller

(From her book, *"Midstream—My Later Life,"*  
published by Doubleday, Doran & Co., Inc., 1929)

One of the most memorable events of our Wrentham years was our visit to Mark Twain.

My memory of Mr. Clemens runs back to 1894, when he was vigorous, before the shadows began to gather. Such was the affection he inspired in my young heart that my love for him has deepened with the years. More than anyone else I have known except Dr. Alexander Graham Bell and my teacher, he aroused in me the feeling of mingled tenderness and awe. I saw him many times at my friend Lawrence Hutton's in New York, and later in Princeton, also at Mr. H.H. Rogers' and at his own home at 21 Fifth Avenue, and last of all at Stormfield, Connecticut. Now and then I received letters from him. We were both too busy to write often, but whenever events of importance in our lives occurred we wrote to each other about them.

I was fourteen years old when I first met Mr. Clemens — one Sunday afternoon when Miss Sullivan and I were the guests of Mr. and Mrs. Lawrence Hutton in New York. During the afternoon several celebrities dropped in, and among them Mr. Clemens. The instant I clasped his hand in mine, I knew that he was my friend. He made me laugh and feel thoroughly happy by telling some good stories, which I read from his lips. I have forgotten a great deal more than I remember, but I shall never forget how tender he was.

He knew with keen and sure intuition many things about me and how it felt to be blind and not to keep up with the swift ones—things that others learned slowly or not at all. He never embarrassed me by saying how terrible it is not to see, or how dull life must be, lived always in the dark. He wove about my dark walls romance and adventure, which made me feel happy and important. Once when Peter Dunne, the irrepressible Mr. Dooley, exclaimed: "God, how dull it must be for her, every day the same and every night the same as the day," he said, "You're damned wrong there; blindness is an exciting business, I tell you; if you don't believe it, get up some dark night on the wrong side of your bed when the house is on fire and try to find the door."

The next time I saw Mr. Clemens was in Princeton during a spring vacation when we were visiting the Huttons in their new home. We had many happy hours together at that time.

One evening in the library he lectured to a distinguished company—Woodrow Wilson was present—on the situation in the Philippines. We listened breathlessly. He described how six hundred Moros—men, women, and children—had taken refuge in an extinct crater bowl near Jolo, where they were caught in a trap

and murdered, by order of General Leonard Wood. A few days afterwards, Col. Funston captured the patriot Aguinaldo by disguising his military marauders in the uniform of the enemy and pretending to be friends of Aguinaldo's officers. Upon these military exploits, Mr. Clemens poured out a volcano of invective and ridicule. Only those who heard him can know his deep fervour and the potency of his flaming words. All his life he fought injustice wherever he saw it in the relations between man and man—in politics, in wars, in outrages against the natives of the Philippines, the Congo, and Panama. I loved his views on public affairs, they were so often the same as my own.

He thought he was a cynic, but his cynicism did not make him indifferent to the sight of cruelty, unkindness, meanness or pretentiousness. He would often say, "Helen, the world is full of unseeing eyes, vacant, staring, soulless eyes." He would work himself into a frenzy over dull acquiescence in any evil that could be remedied. True, sometimes it seemed as if he let loose all the artillery of Heaven against an intruding mouse but even then his "resplendent vocabulary" was a delight. Even when his ideas were quite wrong, they were expressed with such lucidity, conviction, and aggressiveness that one felt impelled to accept them—for the moment at least. One is almost persuaded to accept any idea which is well expressed.

He was interested in everything about me—my friends and little adventures and what I was writing. I loved him for his beautiful appreciation of my teacher's work. Of all the people who have written about me he is almost the only one who has realized the importance of Miss Sullivan in my life, who has appreciated her "brilliancy, penetration, wisdom, character, and the fine literary competences of her pen."

He often spoke tenderly of Mrs. Clemens and regretted that I had not known her.

"I am very lonely, sometimes, when I sit by the fire after my guests have departed," he used to say. "My thoughts trail away into the past. I think of Livy and Susie and I seem to be fumbling in the dark folds of confused dreams. I come upon memories of little intimate happenings of long ago that drop like stars into the silence. One day everything breaks and crumbles. It did the day Livy died." Mr. Clemens repeated with emotion and inexpressible tenderness the lines which he had carved on her tombstone:

Warm summer sun,  
Shine kindly here;  
Warm Southern wind  
Blow softly here;  
Green sod above,  
Lie light, lie light;  
Good night, dear heart,  
Good night, good night.

The year after her death he said to me, "This has been the saddest year I have ever known. If it were not that work brings forgetfulness, life would be intolerable." He expressed regret that he had not accomplished more. I exclaimed, "Why, Mr. Clemens, the whole world has crowned you. Already your name is linked with the greatest names in our history. Bernard Shaw



compares your work with that of Voltaire, and Kipling has called you the American Cervantes."

"Ah, Helen, you have a honeyed tongue; but you don't understand. I have only amused people. Their laughter has submerged me."

There are writers who belong to the history of their nation's literature. Mark Twain is one of them. When we think of great Americans we think of him. He incorporated the age he lived in. To me he symbolizes the pioneer qualities—the large, free, unconventional, humorous point of view of men who sail new seas and blaze new trails through the wilderness. Mark Twain and the Mississippi River are inseparable in my mind. When I told him that Life on the Mississippi was my favourite story of adventure, he said, "That amazes me. It wouldn't have occurred to me that a woman would find such rough reading interesting. But I don't know much about women. It would be impossible for a person to know less about women than I do."

After some badinage back and forth about women, Mr. Clemens's manner changed. A sadness came into his voice. "Those were glorious days, the days on the Mississippi. They will come back no more, life has swallowed them up, and youth will come no more. They were days when the tide of life was high, when the heart was full of the sparkling wine of romance. There have been no other days like them."

It was just after he had read my book The World I Live In, that he sent a note to Wrentham saying, "I command you all three to come and spend a few days with me in Stormfield."

It was indeed the summons of a beloved king. His carriage met us at Redding station. If my memory serves me, it was in February; there was a light snow upon the Connecticut hills. It was a glorious five mile drive to Stormfield; little icicles hung from the edges of the leaves and there was a tang in the air of cedar and pine. We drove rapidly along the winding country roads, the horses were in high spirits. Mr. Macy kept reading signboards bearing the initials "M. T." As we approached the Italian villa on the very top of the hill, they told me he was standing on the verandah waiting. As the carriage rolled between the huge granite pillars, he waved his hand; they told me he was all in white and that his beautiful white hair glistened in the afternoon sunshine like the snow spray on the gray stones.

There was a bright fire on the hearth, and we breathed in the fragrance of pine and the orange pekoe tea. I scolded Mr. Clemens a little for coming out on the verandah without his hat; there was still a winter chill in the air. He seemed pleased that I thought about him in that way, and said rather wistfully, "It is not often these days that anyone notices when I am imprudent."

We were in the land of enchantment. We sat by the fire and had our tea and buttered toast and he insisted that I must have strawberry jam on my toast. We were the only guests. Miss Lyon, Mr. Clemens' secretary, presided over the tea table.

Mr. Clemens asked me if I would like to see the house, remarking that people found it more interesting than himself.

Out of the living room there was a large sunny, beautiful loggia, full of living plants and great jardinieres filled with wild grasses, cat-tails, golden-rod, and thistles which had been gathered on the hills in the late fall. We returned through the living room to the dining room and out on the pergola and back again to the house and into the billiard room, where Mr. Clemens said he spent his happiest hours. He was passionately fond of billiards, and very proud of the billiard table with which Mrs. H. H. Rogers had presented him. He said he would teach me to play.

I answered, "Oh, Mr. Clemens, it takes sight to play billiards."

"Yes," he teased, "but not the variety of billiards that Paine and Dunne and Rogers play. The blind couldn't play worse." Then upstairs to see Mr. Clemens' bedroom and examine the carved bedposts and catch a glimpse of the view out the great windows before darkness closed in upon us.

"Try to picture, Helen, what we are seeing out of these windows. We are high up on a snow-covered hill. Beyond, are dense spruce and firwoods, other snow-clad hills and stone walls intersecting the landscape everywhere, and over all, the white wizardry of winter. It is a delight, this wild, free, fir-scented place."

Our suite of rooms was next to his. On the mantelpiece, suspended from a candlestick, was a card explaining to burglars where articles of value were in the room. There had recently been a burglary in the house, and Mr. Clemens explained that this was a precaution against being disturbed by intruders.

"Before I leave you," he said, "I want to show you Clara's room; it is the most beautiful apartment in the house."

He was not content until he had shown us the servants' quarters, and he would have taken us to the attic if Miss Lyon had not suggested that we leave it for another day. It was obvious that Mr. Clemens took great satisfaction in his unusual house. He told us that it had been designed by the son of my life-long friend, William Dean Howells. Delightfully he pointed out that the architecture was exactly suited to the natural surroundings, that the dark cedars and pines, which were always green, made a singularly beautiful setting for the white villa. Mr. Clemens particularly enjoyed the sunlight that came through the great windows and the glimpse of field and sky that could be seen through them.

"You observe," he said to us, "there are no pictures on the walls. Pictures in this house would be an impertinence. No artist, going to this window and looking out, has ever equalled that landscape."

We stayed in our room till dinner was announced. Dinner in Mr. Clemens' house was always a function where conversation was important; yes, more important than the food. It was a rule in that house that guests were relieved of the responsibility of conversation. Mr. Clemens said that his personal experience had taught him that you could not enjoy your dinner if the burden of finding something to say was weighing heavily upon you. He made it a rule, he said, to do all the talking in his own house, and expected when he was invited out that his hosts would do the same. He talked delightfully, audaciously, brilliantly.



His talk was fragrant with tobacco and flamboyant with profanity. I adored him because he did not temper his conversation to any femininity. He was a playboy sometimes and on occasions liked to show off. He had a natural sense of the dramatic, and enjoyed posing as he talked. But in the core of him there was no make-believe. He never attempted to hide his light under a bushel. I think it was Goethe who said, "Only clods are modest." If that is true, then in the world there was not less of a clod than Mr. Clemens.

He ate very little himself, and invariably grew restless before the dinner was finished. He would get up in the midst of a sentence, walk round the table or up and down the long dining room, talking all the while. He would stop behind my chair, and ask me if there was anything I wanted; he would sometimes take a flower from a vase and if I happened to be able to identify it he showed his pleasure by describing in an exaggerated manner the powers that lie latent in our faculties, declaring that the ordinary human being had not scratched the surface of his brain. This line of observation usually led to a tirade upon the appalling stupidity of all normal human beings. Watching my teacher spelling to me, he drawled, "Can you spell into Helen's left hand and tell her the truth?" Sometimes the butler called his attention to a tempting dish, and he would sit down and eat.

To test my powers of observation, he would leave the room quietly and start the self-playing organ in the living room. My teacher told me how amusing it was to see him steal back to the dining room and watch stealthily for any manifestations on my part that the vibrations had reached my feet. I did not often feel the musical vibrations, as I believe the floor was tiled, which prevented the sound waves from reaching me, but I did sometimes feel the chord vibrations through the table. I was always glad when I did, because it made Mr. Clemens so happy.

We gathered about the warm hearth after dinner, and Mr. Clemens stood with his back to the fire talking to us. There he stood—our Mark Twain, our American, our humorist, the embodiment of our country. He seemed to have absorbed all America into himself. The great Mississippi River seemed forever flowing, flowing through his speech, through the shadowless white sands of thought. His voice seemed to say like the river, "Why hurry? Eternity is long; the ocean can wait." In reply to some expression of our admiration for the spaciousness and the beauty of the room, which was a combination of living room and library, he said with more enthusiasm than was his wont, "It suits me perfectly. I shall never live anywhere else in this world."

He was greatly interested when we told him that a friend of ours, Mr. W. S. Booth, had discovered an acrostic in the plays, sonnets, and poems usually attributed to Shakespeare, which revealed the author to be Francis Bacon. He was at first sceptical and inclined to be facetious at our expense. He attacked the subject vigorously, yet less than a month elapsed before he brought out a new book, Is Shakespeare Dead? in which he set out, with all his fire, to destroy the Shakespeare legend, but not, he said in a letter to me, with any hope of actually doing it.

"I wrote the booklet for pleasure—not in the expectation of convincing anybody that Shakespeare did not write Shakespeare. And don't you," he warned me, "write in any such expectation. Shakespeare, the Stratford tradesman, will still be the divine Shakespeare to our posterity a thousand years hence."

When the time came to say good night, Mr. Clemens led me to my room himself and told me that I would find cigars and a thermos bottle with Scotch whiskey, or Bourbon if I preferred it, in the bathroom. He told me that he spent the morning in bed writing, that his guests seldom saw him before lunch time, but if I felt like coming in to see him about ten-thirty, he would be delighted, for there were some things he would like to say to me when my Guardian Angel was not present.

About ten o'clock the next morning, he sent for me. He liked to do his literary work in bed, propped up among his snowy pillows looking very handsome in his dressing gown of rich silk, dictating his notes to a stenographer. He said if doing my work that way appealed to me, I might have half the bed, provided I maintained strict neutrality and did not talk. I told him the price was prohibitive, I could never yield woman's only prerogative, great as the temptation was.

It was a glorious bright day, and the sun streamed through the great windows. Mr. Clemens said if I did not feel inclined to work after lunch (which was by way of sarcasm, as he had previously remarked that I did not look industrious and he believed that I had somebody to write my books for me), he would take a little walk with us and show us the "farm." He said he would not join us at lunch, as his doctor had put him on a strict diet. He appeared, however, just as dessert was being served. He said he had smelt the apple pie and could not resist. Miss Lyon protested timidly.

"Oh, Mr. Clemens——"

"Yes, I know; but fresh apple pie never killed anybody. But if Helen says I can't, I won't." I did not have the heart to say he couldn't, so we compromised on a very small piece, which was later augmented by a larger piece, after a pantomimic warning to the others not to betray him.

I suspected what was going on, and said, "Come, let us go before Mr. Clemens sends to the kitchen for another pie."

He said, "Tell her I suspected she was a psychic. That proves she is."

He put on a fur-lined greatcoat and fur cap, filled his pockets with cigars, and declared himself ready to start on the walk. He led me through the pergola, stopping to let me feel the cedars which stood guard at every step.

"The arches were intended for ramblers," he said, "but unfortunately they haven't bloomed this winter. I have spoken to the gardener about it, and I hope the next time you come we shall have roses blooming for you." He picked out a winding path which he thought I could follow easily. It was a delightful path, which lay between rocks and a saucy little brook that winter had not succeeded in binding with ice fetters. He asked Mr. Macy to tell me there was a tall white building across an intervening valley from where we were standing. "Tell her it's a church. It used to stand on this side of the brook; but the congregation moved it last summer when I told them I had no use for it. I had no idea that New England people were so accommodating. At that distance it is just what a church should be—serene and pure and mystical." We crossed the brook on a little rustic footbridge. He said it was a prehistoric bridge, and that the



quiet brown pool underneath was the one celebrated in the Songs of Solomon. I quoted the passage he referred to: "Thine eyes like the fishpools in Heshbon, by the gate of Bath-rabbim." It was a joy being with him, holding his hand as he pointed out each lovely spot and told some charming untruth about it. He said, "The book of earth is wonderful. I wish I had time to read it. I think if I had begun in my youth, I might have got through the first chapter. But it's too late to do anything about it now."

We wandered on and on, forgetful of time and distance, beguiled by stream and meadow and seductive stone walls wearing their autumn draperies of red and gold vines a little dimmed by rain and snow, but still exquisitely beautiful. When we turned at last, and started to climb the hill, Mr. Clemens paused and stood gazing over the frosty New England valley, and said, "Age is like this, we stand on the summit and look back over the distance and time. Alas, how swift are the feet of the days of the years of youth." We realized that he was very tired, Mr. Macy suggested that he should return crosslots and meet us on the road with a carriage. Mr. Clemens thought this a good idea, and agreed to pilot Mrs. Macy and me to the road, which he had every reason to suppose was just beyond that elephant of a hill. Our search for that road was a wonderful and fearsome adventure. It led through cowpaths, across ditches filled with ice-cold water into fields dotted with little islands of red and gold which rose gently out of the snow. On closer inspection we found that they were composed of patches of dry goldenrod and huckleberry bushes. We picked our way through treacherously smiling cart roads. He said, "Every path leading out of this jungle dwindles into a squirrel track and runs up a tree." The cart roads proved to be ruts that ensnared our innocent feet. Mr. Clemens had the wary air of a discoverer as he turned and twisted between spreading branches of majestic pines and dwarfed hazel bushes. I remarked that we seemed to be away off our course. He answered, "This is the uncharted wilderness. We have wandered into the chaos that existed before Jehovah divided the waters from the land. The road is just over there," he asserted with conviction. "Yes," we murmured faintly, wondering how we should ever ford the roaring, tumbling imp of a stream which flung itself at us out of the hills. There was no doubt about it. The road was just there "where you see that rail fence." Prophecy deepened into happy certainty when we saw Mr. Macy and the coachman waiting for us. "Stay where you are," they shouted. In a few seconds they had dismembered the rail fence and were transporting it over the field. It did not take them long to construct a rough bridge, over which we safely crossed the Redding Rubicon, and sure enough, there was the narrow road of civilization winding up the hillside between stone walls and clustering sumachs and wild cherry trees on which little icicles were beginning to form like pendants. Half way down the drive Miss Lyon met us with tearful reproaches. Mr. Clemens mumbled weakly, "It has happened again—the woman tempted me."

I think I never enjoyed a walk more. Sweet is the memory of hours spent with a beloved companion. Even being lost with Mr. Clemens was delightful, although I was terribly distressed that he should be exerting himself beyond his strength. He said many beautiful things about Stormfield, for instance, "It is my Heaven. Its repose stills my restlessness. The view from every point is superb and perpetually changes from miracle to miracle, yet nature never runs short of new beauty and charm." I hope the report is not true that he came to hate the place and feel that he had been defrauded of the society of his fellow men. But I can understand that a temperament like Mr. Clemens' would grow weary of the solitude.

The last evening of our visit we sat around a blazing log fire, and Mr. Clemens asked me if I would like to have him read me "Eve's Diary." Of course I was delighted.

He asked, "How shall we manage it?"

"Oh, you will read aloud, and my teacher will spell your words into my hand."

He murmured, "I thought you would read my lips."

"I should like to, of course; but I am afraid you will find it very wearisome. We'll start that way anyhow, and if it doesn't work, we'll try the other way." This was an experience, I am sure, no other person in the world had ever had.

"You know, Mr. Clemens," I reminded him, "that we are going home tomorrow, and you promised to put on your Oxford robe for me before I went."

"So, I did, Helen, and I will—I will do it now before I forget."

Miss Lyon brought the gorgeous scarlet robe which he had worn when England's oldest university conferred upon him the degree of Doctor of Letters. He put it on, and stood there in the fire light the embodiment of gracious majesty. He seemed pleased that I was impressed. He drew me towards him and kissed me on the brow, as a cardinal or pope or feudal monarch might have kissed a little child.

How I wish I could paint the picture of that evening! Mr. Clemens sat in his great armchair, dressed in his white serge suit, the flaming scarlet robe draping his shoulders, and his white hair gleaming and glistening in the light of the lamp which shone down on his head. In one hand he held "Eve's Diary" in a glorious red cover. In the other hand he held his pipe. "If it gets in the way," he said, "I'll give it up, but feel embarrassed without it." I sat down near him in a low chair, my elbow on the arm of his chair, so that my fingers could rest lightly on his lips. Mr. Macy lighted his cigar, and the play began. Everything went smoothly for a time. I had no difficulty getting the words from his lips. His pleasant drawl was music to my touch, but when he began gesticulating with his pipe, the actors in the drama got mixed up with the properties and there was confusion until the ashes were gathered into the fireplace. Then a new setting was arranged. Mrs. Macy came and sat beside me and spelled the words into my right hand, while I looked at Mr. Clemens with my left, touching his face and hands and the book, following his gestures and every changing expression. As the reading proceeded, we became utterly absorbed in the wistful, tender chronicle of our first parents. Surely, the joy, the innocence, the opening mind of childhood are among life's most sacred mysteries, and if young Eve laughs she makes creation all the sweeter for her Heaven-born merriment. The beauty of Mr. Clemens' voice, when Eve sighed her love, and when Adam stood at her grave grieving bitterly saying "wheresoever she was, there was Eden" caused me to weep openly, and the others swallowed audibly. Every one of us felt the yearning homesickness in that cry of pain.

To one hampered and circumscribed as I am it was a wonderful experience to have a friend like Mr. Clemens. I recall many talks with him about human affairs. He never made me feel that my opinions were worthless, as so many



people do. He knew that we do not think with eyes and ears, and that our capacity for thought is not measured by five senses. He kept me always in mind while he talked, and he treated me like a competent human being. That is why I loved him.

Perhaps my strongest impression of him was that of sorrow. There was about him the air of one who had suffered greatly. Whenever I touched his face his expression was sad, even when he was telling a funny story. He smiled, not with the mouth but with his mind—a gesture of the soul rather than of the face. His voice was truly wonderful. To my touch, it was deep, resonant. He had the power of modulating it so as to suggest the most delicate shades of meaning and he spoke so deliberately that I could get almost every word with my fingers on his lips. Ah, how sweet and poignant the memory of his soft slow speech playing over my listening fingers. His words seemed to take strange lovely shapes on my hands. His own hands were wonderfully mobile and changeable under the influence of emotion. It has been said that life has treated me harshly; and sometimes I have complained in my heart because many pleasures of human experience have been withheld from me, but when I recollect the treasure of friendship that has been bestowed upon me I withdraw all charges against life. If much has been denied me, much, very much has been given me. So long as the memory of certain beloved friends live in my heart I shall say that life is good.

The affluence of Mr. Clemens' mind impressed me vividly. His felicitous words gushed from it with the abundance of the Shasta Falls. Humour was on the surface, but in the centre of his nature was a passion for truth, harmony, beauty.

Once he remarked in his pensive, cynical way, "There is so little in life that is not pretence."

"There is beauty, Mr. Clemens."

"Yes, there is beauty, and beauty is the seed of spirit from which we grow the flowers that shall endure."

I did not realize until I began this sketch how extremely difficult it would be to recapture Mr. Clemens' happy phrases from my memory. I am afraid I should not have succeeded at all if I had not made a few notes after my conversation with him. But I believe I have never falsified a word or an emphasis of the spirit of his utterances.

Time passed at Stormfield as it passes everywhere else, and the day came when we had to say good-bye. The kindly white figure stood on the verandah waving us farewell, as he had waved his welcome when we arrived. Silently we watched the stately villa on the white hilltop fading into the purple distance. We said to each other sadly, "Shall we ever see him again?" And we never did. But we three knew that we had a picture of him in our hearts which would remain there forever. In my fingertips was graven the image of his dear face with its halo of shining white hair, and in my memory his drawling, marvellous voice will always vibrate.

I have visited Stormfield since Mark Twain's death. The flowers still bloom; the breezes still whisper and sigh in the cedars, which have grown

statelier year by year; the birds still sing, they tell me. But for me the place is bereft of its lover. The last time I was there, the house was in ruins. Only the great chimney was standing, a charred pile of bricks in the bright autumn landscape.

As I sat on the step where he had stood with me one day, my hand warm in his, thoughts of him, like shadowy presences, came and went, sweet with memory and with regret. Then I fancied I felt someone approaching me; I reached out, and a red geranium blossom met my touch! The leaves of the plant were covered with ashes, and even the sturdy stalk had been partly broken off by a chip of falling plaster. But there was the bright flower smiling at me out of the ashes. I thought it said to me, "Please don't grieve." I brought the plant home and set it in a sunny corner of my garden, where always it seems to say the same thing to me, "Please don't grieve." But I grieve, nevertheless.



## A TRIBUTE TO PETER SALMON, FRIEND OF THE DEAF-BLIND\*

*By Joseph Hunt*

No identifiable minority of people is so small as those who are both deaf and blind. Moreover, when it is a question of articulating their problems and eliciting responses to their needs, they have an obvious built-in disadvantage which no one in his right mind would try to disguise with an easy coating of optimism.

We are not up against a new question when we ask ourselves what a National agency can do even for the most distressed individual's very personal, down-to-earth problems, over which central power is disadvantaged like a giant trying to carve cherry stones.

Nevertheless, we have slowly recognized that the major problem of blindness is not that communities are overwhelmed by numbers of blind people, but that both communities and blind people are isolated and thereby overwhelmed by a kind of loneliness in problem solving and therefore, are missing the advantages of collective efforts. Both the individual suffering from an atypical problem and a society struggling to help him have a disproportionate and crucial stake in all kinds of clearing houses, metropolises, or meccas. This suggests very strongly a problem that individuals cannot solve for themselves or solve so well as they can together.

The Vocational Rehabilitation Administration has so regarded the problems of blindness for a number of years and this has included the problem of blindness combined with deafness, even when we have not known what to do about the latter.

No matter where you begin to work on this question, you come, in the end, to the need for people; you come to the need for a very special kind of people. I do not think a National program for the deaf-blind could invest too heavily in finding and in bolstering the constructive character and the creative personality. And in this extremely difficult problem communication with truly wise people at the grass roots has been indispensable.

I really do not know what we would have done without the sterling qualities of Peter Salmon in this area where the human element is so crucial. He is a living example of the special kind of excellence required.

We look with admiration on the seven volumes published by the Industrial Home for the Blind at the culmination of its first VRA supported project for deaf-blind persons. In these publications the point was repeatedly made that the

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(\* Excerpted from "DEAF-BLIND PERSONS AND THEIR NEED AS SEEN BY A NATIONAL AGENCY" an Address made at the 36th Annual Convention of the American Association of Workers for the Blind, Inc., Pick-Carter Hotel, Cleveland, Ohio, July 10, 1962).

findings of the study should be implemented in program terms. We have taken this admonition to heart in the Vocational Rehabilitation Administration, and we are glad indeed that once again we are to move ahead on problems of the deaf-blind with the IHB.

Recently the Vocational Rehabilitation Administration approved a pilot demonstration project to develop a regional service for deaf-blind persons. This is one of a series of measures to meet a responsibility over which our whole staff feels very sincere concern. Once again this is in partnership with the Industrial Home for the Blind. Once again Peter Salmon is the friend of man willing to undertake a project which might cause the staunchest soul to hold back. Peter will have full responsibility for the total project and will serve as chairman of the administrative and planning committee of the project.\*

Those who have given any attention to the deeply touching and poignant writings of deaf-blind people cannot but be struck by the all-important element of human relationships on the very highest levels of altruism and friendship. Perhaps some of the most eloquent words in the human language are utterances of deaf-blind people concerning those who have helped them. There is a kind of haunting magic to it, especially Laura Bridgman's speaking of Dr. Howe as "The noblest visitor."

For this reason I think it may be profitable to stop and ask ourselves: What are the most noticeable characteristics of the constructive character and the creative personality?

The first attribute I would like to list is one which is sometimes rated too high and sometimes too low, but seldom calculated at its true and sterling worth. I refer to smartness, brains, intelligence. I hasten to add that there is no human trait which is so easily ruined by the adulation of others or by the conceit of the possessor.

This brings me to the second all-important attribute of the constructive character and creative personality — humility, the common touch, the realization of our mutual humanity, our relative importance or unimportance.

Very close to this attribute, indeed almost indistinguishable from it, is friendship with the world, the ability to relate to an isolated individual as well as to the whole ball park, but not to take the part of isolation against the world. The constructive character and creative personality cannot be mad at the world. Rather it is characterized by the gift for saying those things which make people feel better toward each other, their country and the world. Winston Churchill and our own President\*\* are eminent examples of characters and personalities with this outstanding quality. This leads us to another trait very closely related: articulateness, communicativeness and all that these things mean by way of willingness to put out, to go out of our way, to go the second mile.

Clearly the constructive character and creative personality is social in tendency to the point where no one could doubt its willingness to fraternize and this must come out not only in action, but in words.

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\* VRA Project #1004: Regional Rehabilitation Services for Deaf-Blind Persons. BLINDNESS, 1964, p. 23.

\*\* 1962 — John Fitzgerald Kennedy.



The most important trait which anyone in the field of rehabilitation can have is a creative or building tendency, which deeply and subtly permeates everything said or done, even astringent words or seemingly antagonistic actions, which may be necessary to bring someone down to earth.

Yet we must not weight our challenge so heavily as to crush those we want to help. I should think that with deaf-blind clients more than any other human beings this would require the keenest insight and judgment. And the hazards are a little frightening. For once the individual decides to withdraw himself, the defenses which he has against our reaching him are truly appalling.

I look with real hope and real pride at the professional skills of the persons who are to be a part of the IHB-VRA program. And as I think of them and their extraordinary challenge I would like to remind these persons that there is no group of blind people of whom more is required by way of forbearance toward certain of the innocent presumptions of others, including others who are initiated and should know better.

As we all get into the act there is one thing about which we must be very watchful. This is that we be thoughtful and careful and precise, especially in our attention to personal services. Old teachers of the deaf-blind in the 19th Century set a very high standard in this respect. They planned what they did. They took infinite pains in doing it. They observed with the utmost care the results and did not hesitate to describe their own shortcomings.

It will be just too bad if all of our inventions take us so far away from the habit of taking pains that in the end we are corrupted by our own technology.

The Vocational Rehabilitation Administration investment of one-half million dollars for the deaf-blind at the Industrial Home for the Blind has been an investment of faith in human beings, especially Peter Salmon.





# THE CANADIAN NATIONAL INSTITUTE FOR THE BLIND - A STUDY IN ACHIEVEMENT

*By Col. E. A. Baker and A. N. Magill*

A national community agency that enables the people it serves to earn more than it receives from donations and grants is The Canadian National Institute for the Blind.

In 1965, CNIB received \$3,072,637 from grants, bequests and donations. In the same year blind persons earned \$4,430,339. This means that the blind of Canada earned more than a million dollars in excess of all CNIB donations and grants. This unusual achievement came about through the CNIB employment service, which, in turn, reflected intensive training through the National Vocational Training program.

## Library Has 100,000 Book Records

In the same year CNIB operated 20 residences and general service centres for more than 900 blind people, served 25,000 blind persons through 50 offices, provided home teaching and administered a library of 100,000 book records and 20,000 Braille volumes.

Today blind people are accepted in a wide variety of jobs from the executive desk to the janitor. Yet of the 25,000 eligible for CNIB service, only 2,000 hold full-time posts. A look at the age break-down of Canada's blind population soon shows why. Forty-six percent are over 65 when they lose their sight. One thousand eight hundred are children under 20 still going to school. Another 7,500 are married women with a majority housewives. Eliminating these groups and allowing for other disabilities among those of an employable age, it is easy to understand why only 2,000 blind persons work full-time. Among these 2,000 are people in all walks of life whose employment needs are met through vocational training and CNIB placement service.

In industry, the blind employment officers survey plants, convince company management of the capabilities of a blind worker, train the man on the job and call back frequently to check on his progress.

A new development last year added computer-programming to the opportunities for capable blind persons. Four blind persons were enrolled in the pilot project at the University of Manitoba. The five-month course qualified the blind trainees as computer programmers for firms using electronic data processing. In class, the four young men learned to program IBM 1401 computers, translated verbal reports of the analyst into written instructions to the computer and learned to use a punch card reader, obtained from the University of Cincinnati, pioneers in computer programming for the blind. The four trainees graduated successfully and since have been placed in positions in the computer field. A second group of carefully selected persons is now on course.

In recent years young blind women have found a new career open to them. Special courses for young women are leading blind dictaphone typists to office positions with large firms. After ten months' instruction and study, also made possible by National Vocational Training, they graduate with a typing speed of 60 words a minute and a basic knowledge of accurate spelling. The telephone switchboard too, with a touch-type board and training for the blind operator, has opened an additional avenue of employment for competent blind girls.

Along with these developments has grown the CNIB Catering Department. A pioneer in the field, CNIB opened its first canteen in 1929. It served coffee and sandwiches to the employees of a small firm in Toronto. By 1934 CNIB had established a separate department, specializing in employee catering. Today the catering program has spread from coast to coast and provides a complete food service in business, industry and Government buildings. More than 600 blind persons hold positions in 477 catering locations. The dining facilities in these locations are modern in every way, designed in harmony with the functional architecture of today and providing a community service in which blind associates take pride.

There also are openings for blind people on the CNIB professional staff. In this field several months' intensive training and work experience is necessary. These courses are on a nine to five basis, five days a week, and require considerable after-hours' study and written examinations. Perhaps the most important of these graduates are those who become field secretaries. These men are carefully chosen for their ability and background before they are assigned to the training course. On completion of their training they are placed in one of CNIB's 50 locations. While these representatives have their offices in the larger cities of Canada, their work takes them far out into the surrounding counties and districts.

Much of the progress in the work of the CNIB is due to the energetic efforts of these sightless field men. Their first task is to contact the blind people in the district assigned to them, and learn their condition, needs and abilities. When the CNIB Field Secretary calls for the first time on a newly-blind person, his own sightlessness and capabilities make an immediate and lasting impression. The new client cannot say "Why don't you practice what you preach?" as he might if the officer were sighted. His very presence, the fact that he controls an office, even his ability to light a cigarette, all give encouragement and restore confidence.

### Blind Teacher Is Confidence Builder

The field man is, in a sense, the contact man for all the other departments of the CNIB. With his first call he begins assessing the blind person. He is familiar with the many services of the Institute, and while he talks he is asking himself which departments can serve this man best. The field man is also responsible for the raising of funds and the public relations program in his area.

Another important staff member to take Vocational Training is the Home Teacher. The teachers, who are also blind, hold the key to the rehabilitation of the newly-blind. They train the newly-blind in Braille reading and writing, and give instruction in all types of handicrafts, such as knitting, mat making and



leather work. Besides providing hobbies, and often a supplementary income, these crafts are a psychological aid to the newly-blinded person in making his adjustment. The example of the blind teacher is a confidence builder during this transitional period.

Today the newly-blind client may move to a CNIB residence and service centre for a rehabilitation course. There he meets other blind persons at various stages of development. Some are in training like himself. Others are permanent residents.

To speed the adjustment period and to provide an outlet for the social needs of the blind, CNIB conducts a Canada-wide recreation program. Blind people bowl, swim, dance, golf, play cards and take an active interest in hockey, football and the World Series. In some provinces, summer camps provide a holiday for active blind people.

#### Low-Cost Vacation Available

Some divisions rent existing camping facilities from other organizations. The Ontario and British Columbia Divisions have built special facilities designed for blind holiday seekers.

In British Columbia, C-Nib Lodge on Bowen Island, just off the Pacific coast, was built at a cost of \$150,000. The modern, attractive, 11,000 square foot lodge is set in a three-acre wooded park with a 400-foot beach front. It offers a low-cost vacation and is available to all 2,540 B. C. blind people. In Ontario an Adjustment-Training-and-Holiday Centre was built on Lake Joseph in the heart of vacationland at a cost of \$400,000. This capital fund was underwritten by the Provincial Government, private citizens and the Lions Clubs of Ontario, who are providing \$350,000. For the past five years more than 500 blind persons and their escorts have enjoyed the five sandy beaches, boating facilities, supervised swimming and outdoor equipment, specially designed for their needs.

Sighted volunteers take an important part in the recreation program. They serve as coaches on the bowling alley and on the links. They share the swimming party or card game and find the project a team work venture where both blind and sighted give and take.

To the success of the recreation program stand 79 clubs of the blind across Canada which have been established for the blind under the aegis of their own organization, The Canadian Council of the Blind, controlled and directed by blind members. Beside them are several thousand sighted volunteers who act on CNIB Boards, Committees and Women's Auxiliaries, assisting in the day-to-day living of blind Canadians.

Another service that proves a constructive aid to the blind of Canada is the National Library. Here under one roof are housed a Talking Book and Braille Department catering to the reading tastes of 25,000 Canadians from coast to coast. The CNIB purchases books from the American Foundation for the Blind and the American Printing House in U.S.A., and from the Royal National Institute for the Blind, London, England. In addition, 135 volunteer brailleists provide Canadian books and special request texts in Braille. There are also 100 volunteers who record Canadian books and students' texts for the Talking Book Library. At present, 90 blind students, the highest number to date, are taking university courses and making good use of the library facilities.

Service to the blind has always been foremost in the CNIB program. Prevention of Blindness also stems from the constitution which came into being in 1918. Since that time, more than 100,000 persons in danger of losing their sight have made use of the prevention program. In 1955, in co-operation with the ophthalmologists of Canada, the University of Toronto, and other universities, CNIB set up the Eye Bank of Canada. Under these auspices, 1,000 Canadians have had useful vision restored through the corneal transplant service. More than 50,000 thoughtful sighted citizens have signed pledge cards, authorizing the donation of their eyes to the Eye Bank of Canada at their death.

#### More Than 50 Grants In Four Years

In 1962 when Col. Baker retired after 42 years of service to Canada and the world, the CNIB established the E. A. Baker Foundation for the Prevention of Blindness. The fund was set up to perpetuate Col. Baker's name and to continue his prevention of blindness interests. The purpose of the Foundation is the provision of scholarships, fellowships and specified grants to ophthalmologists and their allied services for research, equipment and other facilities not available through regular channels. In its four years of operation, the Foundation has made more than 50 grants to further the advancement of ophthalmology in Canada.

Through the provision of community clinics, Glaucoma surveys, the Wise Owl Club of Canada, the production of films and public education material, CNIB is attempting to inform Canadians in general of the importance of good eye health and the care of their sight.

Both the prevention and rehabilitation services are a part of the same fabric. Through the team work of the professional staff and the volunteers, the CNIB maintains both phases of its responsibilities at a high level.



# COLONEL EDDIE BAKER: A PORTRAIT

*By Marjorie Wilkins Campbell*

"He could have had so many more friends. . ."

Does that seem a startling comment to make about Col. E. A. Baker, the man who for half a century probably has been the greatest friend of the blind in the world? Does it reflect the opinion, in essence, of the scores of men and women whom I interviewed while writing his biography?

Most people who know Col. Baker would say, without pausing to consider, that he has thousands of friends in a hundred cities in a dozen countries. They would mention his great capacity for friendship, his concern for his fellow men, especially those who are handicapped. My files are rich with such comments. But you do not rely on casual statements when you are writing the biography of a great man, in this case the man who in 1951 became the first president of the World Council for the Welfare of the Blind and was twice re-elected to make a total of 13 difficult policy-establishing years.

"It's Lonely At The Top"

Only gradually, with repeated interviews, did a truer picture emerge. It developed, incident by incident, anecdote after anecdote, from those who referred to him familiarly as "Eddie" and from colleagues who spoke respectfully and often affectionately of "The colonel".

Though they said it in different ways, most said pretty much the same thing: "No one has done more to befriend the blind. But it's lonely at the top. A man can't be the impartial leader of men and women of every creed and skin color, all political beliefs and economic levels, and fraternize with individuals. There just isn't time."

No one suggested that Col. Baker objectively recognized the fact that he must choose between expanding the time, energy and heart necessary to hold friends and working for a common good. He wastes little time counting costs. "When I see something that needs to be done, I try to do it, if it's at all practicable. Maybe we succeed the first time. Often we have to stand back and take another look."

Col. Baker has been doing that for fifty years, accomplishing so much that he has had little time to develop the friendships for which he has a warm, natural flair. It is my belief that the greatest sacrifice he has made — and his life has been one of splendid sacrifice and devotion to the needs of others — is that of limiting the number of his close friends. Though he has always had countless admirers, he would be a lonely man were it not for his family.

I had not met him before Mr. Jack McClelland, of the Toronto publishing house of McClelland & Stewart, suggested writing the biography, and I faced our first meeting with misgiving: Suppose we did not like each other? Suppose he did not trust me?

Miss Grace Worts, his secretary since 1920, ushered me into the bright, simply furnished office of the managing director of the Canadian National Institute for the Blind. Only later did I add up the items that were to form my image of this tall man with the disciplined, military bearing, the silvery hair, the dignified double-breasted suit.

### Weeks of Thought Into Questions

For the moment I was amazed by the aplomb with which he rose from his chair behind his broad, tidy desk, came around, held out his strong hand and spoke a pleasant good-morning. Forgotten were the misgivings as we chatted for an hour and arranged further meetings.

I put weeks of thought into the questions I should ask him. Then, during further weeks, he answered most of them with a tape between us. I liked his diffidence, his innate modesty, his lucid comment, his sentimental recollection of his childhood and the delicacy with which he parried such highly personal subjects as his courtship of and marriage to Jessie Robinson, the lovely volunteer nurse of the First World War to whom he refers as "Bill". Almost never did he repeat himself, and the questions and replies ran to 1500 pages, transcribed by blind typists at the CNIB.

Edwin Albert Baker was born in 1883, in his family's stone farm house near Kingston, on the shore of Lake Ontario. Until he entered Queen's University at Kingston, he attended the local school and helped on the farm. A few months after graduating in the then new course in electrical engineering, he enlisted with the 6th Field Company of Engineers. By October, 1915, Lieut. Baker was in the muddy Belgian trenches, where a sniper's bullet ripped across both eyes. He was instantly blinded.

After the initial shock—"I was very sorry to have to leave so early in the game," he pencilled laboriously in a letter to his parents—and when he had been fitted with glass eyes in London, he went to St. Dunstan's for rehabilitation. At St. Dunstan's he studied Braille, typing and business administration, and took up such aids to self assurance as fencing and sculling. He won high marks in his studies, and in what was surely the most notable race on the famous Oxford-Cambridge course on the Thames, the sculling singles with "Chips" Mace, (later Lady Fraser), as coxswain. In the summer of 1916 he returned to Canada, confident that he could earn his living, in business if not as an electrical engineer.

### Made No Compromise With Handicap

But Canada had nothing to offer a young blind ex-officer except a tin cup on a street corner, a fate Baker considered with brief revulsion. For several months he toured the United States, lecturing on behalf of the American Third Victory Loan effort. He served as consultant to the Canadian Department of Soldiers Civil Reestablishment, and helped to found the CNIB.

In December, 1919, on the anniversary of his parents' wedding, he and "Bill" were married; together they built one of Toronto's most charming houses,



had a daughter and three sons, all of whom, served during the Second World War. David, the second son, was shot down in his Fleet Air Arm craft in the Pacific.

The well-planned headquarters of the CNIB was being built when Baker received the cable from Paris announcing his unanimous nomination as first president of the WCWB. On his retirement as managing director of the CNIB in 1962, the E.A. Baker Foundation for Prevention of Blindness was inaugurated, its objective a million-dollar endowment. Truly, Baker had made no compromise with his handicap.

He is a veritable pack rat. Over the years he has collected great files of correspondence, newspaper clippings, telegrams, all priceless aids to a biographer. Especially did they fill out his casual references to his many honors; his work has been recognized by kings and queens, presidents of republics, universities and national and international organizations. He is the only lay member of the Canadian Ophthalmological Society. His files clearly indicated that no one should attempt to write his story without talking to many people in many countries.

#### "Most Confident, Self-Reliant Young Man"

His colleagues, his family and the record: all help to tell what manner of man is Edwin Albert Baker, O.B.E., M.C., Croix de Guerre, B.Sc., LL.D.

"He tried so hard not to be any trouble to anyone," recalled Miss Frances Lloyd, the London nurse who, 50 years before, had helped him to make his first sortie back into society. At almost the same time Sir Arthur Pearson, founder of St. Dunstan's, wrote to Baker's parents: "He is quite the most confident, self-reliant young man of all the 160 blinded soldiers with whom I have come into personal contact so far."

At his first dinner with his family following his return to Canada, he undertook to initiate his mother into his new role: "Don't ever cut my meat, please. There's only one thing I'll ever ask you to do for me — butter my bread. And maybe put a spoon of sugar in my coffee."

"Isn't there some patriotic women's organization who could be interested?" he inquired when he went to Toronto to look for a job and found that the Canadian Free Library for the Blind was about to put its meagre 500 Braille books into storage for lack of library space. Where would the war-blinded men coming home find Braille books and other reading matter if this small collection were put into storage? It was then that the idea of the CNIB was born and Baker evolved the slogan that was to guide his life's work: "I belong to a very select little club, and I want to keep it that way."

Always he would find groups of inspired, able, dedicated women and imaginative, competent business and professional men who would work for and with the blind and work to prevent blindness. It was his firm belief that funds always would be available for the needs of all blind people. Yet months passed following his appointment as managing director of CNIB, shortly after his marriage, before either he or the CNIB Council even mentioned his salary. He and his bride had been getting along on his then very modest blinded veteran's pension.

Baker's wife and family have compensated largely for the hordes of friends he might have had. He has found recreation in his professionally equipped workshop, among his power lathes and saws. He loves a sing-song and used to carry a mouth organ as casually as most men carry a wallet. Once at an executive meeting of the WCWB on Lake Como, the party of blind delegates and their companions returned after a late evening cruise to find that the attendant who would take them up the funicular to their hotel had left for home.

#### Required To Travel Constantly

"We can't stand here shivering," observed Baker, reaching for his mouth organ. Soon everyone forgot how tired and cold they were, as they all joined in singing.

Such diversions have been comparatively few. His work with the CNIB and the WCWB has required almost constant travel. So, too, have his duties as trustee of the American Foundation for the Blind, director of the American Foundation for Overseas Blind, president of the American Association of Workers for the Blind and executive council member of the Royal Commonwealth Society for the Blind, with headquarters in London, England. Now, though he and Mrs. Baker have retired to a pleasant new house near his birthplace, and the pace has slackened, there is still the Foundation. It is his favorite excuse for a trip to Toronto.



# EDUCATION AND (RE)HABILITATION OF THE BLIND: IMPROVEMENT OF CURRENT COOPERATIVE PRACTICES

*By Salvatore G. DiMichael, Ph.D.*

*Regional Representative, New York Vocational Rehabilitation Administration*

There are many cogent reasons why the fields of special education and vocational rehabilitation should work closely together in behalf of the blind. The students of one program become clients of the other. Both programs seek the same major objectives in assisting the blind person to become as independent and fully contributing a member of society as possible. Each agency forms a necessary and adjoining link in a comprehensive community program. Services by either program influence the plans and results of the other.

One may, with comparative ease, enumerate reasons for close cooperation between special education and rehabilitation. However, our purpose is not to extol the virtue of cooperation in general terms. Rather are we proposing that the two fields arrive at broad agreement on the most effective forms for achieving cooperation under present conditions, and on the directions of salutary changes that should be sought in the future.

## Degree of Cooperation Increasing

Fundamentally, this paper contends that now is a most propitious time to make a deliberate united effort — at national, state and local levels — to deal with unsolved major problems in areas of major concern to both programs. If the effort is successful, it should improve the quality and output of each field and redound to the benefit of each blind person affected.

As we shall see, the cooperative efforts have been spasmodic in the past, incidental rather than intensively planned. From the perspective of history it is clear that the degree of cooperation has been increasing as the two programs were becoming better established. We now seem to be on the threshold of a period in which the maturity and strength of each field will permit us to conceive highly productive forms of inter-program collaboration — relatively free from past misunderstandings and half-hearted confidence.

There are many wholesome signs of a forthcoming period of strength and maturity. The 1965 Vocational Rehabilitation Amendments make it possible for the first time to serve all the blind who have potentialities for any form of gainful employment. The U.S. Office of Education has reorganized and increased the status of the Division of Special Education. National, state and local appropriations are being increased for child health, pre-school as well as elementary, secondary, vocational and higher education. The resources of research and demonstration grants in several programs are available to develop better services for multiple-disabled blind persons.

## Benefit of Past Cooperation

The history of work for the blind gives tangible examples of the benefits that accrue from cooperation between special education and rehabilitation. Although the historical account is too extensive to document in this article, a few illustrations may serve our purpose.

The modern rehabilitation center for the blind, first set up for disabled service men of World War II, was the result of recommendations by a national committee that included prominent leaders in special education and rehabilitation. On another front, the first vocational training workshop was established in the United States at Perkins School for the Blind in 1840. This idea later stimulated many private rehabilitation agencies to set up and support workshops.

The first intelligence test for the blind was stimulated by Robert B. Irwin in 1914 when he was in charge of special education in the Cleveland Public Schools. Then, leadership in psychological measurement was assumed by Samuel Hayes of Perkins Institution who devoted a lifetime of work to intelligence and educational achievement tests. Later developments in vocational and personality evaluation were carried out by various researchers, many supported through the vocational rehabilitation program. The sum of all these efforts resulted in a more comprehensive battery of tests for adults as well as younger students.

Improved modern methods of mobility instruction were originated as a part of the rehabilitation of war-blinded service personnel during World War II and later adapted for the civilian blind, adults as well as children. Subsequently, university training courses were supported by the Vocational Rehabilitation Administration. These advancements are now focusing attention upon the improvement of pre-mobility instruction during the school years, as well as the timing and quality of full mobility instruction for the adolescent and adult blind.

### "Largely A Matter of Chance"

The area of vocational guidance serves as an example of how leadership changes from the program of special education to rehabilitation, but materially benefits both. In a 1937 report (1), the Committee on Vocational Guidance of the American Association of Workers for the Blind acknowledged the school's superiority as follows:

"While we have at present the beginnings of vocational guidance for blind children, the vocational guidance of adults is still a virgin field. Whatever is done in the guidance of blind adults with a view to their permanent placement is still largely a matter of chance, unsupported by any program based on definite principles . . . ."

One year later, in 1938, Joseph Clunk (2) described a point of view which began to be felt in private and public rehabilitation agencies:

"It is impossible to enumerate the occupations (for the blind) which are purely individualistic in character and which are dependent upon the initiative, imagination, and peculiar talents of a particular person."



As head of the OVR Section for the Blind after 1943, Clunk and his associates launched an intensive national attack on vocational placements. The momentum of that program is still being felt. It meant the demise of "job lists for the blind" by the middle 1950's. Certainly, it has benefited the schools as may be inferred from the fact that, in a 1946 article, Buell stated that the Overbrook School for the Blind had prepared a book in braille covering 200 occupations. (3) Seen in the perspective of history, special education contributed to the methods of vocational guidance used by rehabilitation agencies prior to 1940; later the advancements made by vocational rehabilitation substantially improved the vocational counseling of adolescent blind students.

We could go on at great length in showing the interacting influences of special education upon rehabilitation, and vice versa, with unquestionable benefit to each other and to the people with visual impairments. Our purpose, however, is more immediate and practical, namely, to evaluate the cooperative practices in current programs and to suggest areas for improvement in the near future.

### Problems in Improving Current Cooperative Practices

In order to evaluate current practices, it is desirable first to view some of our present inadequacies. Then we may briefly observe the university training programs for special educators and for rehabilitation personnel to note their influence upon our cooperative mission. In the last part of this section, we may review some practical and philosophical differences in outlook and attitudes between the two fields.

In 1963, Donald Dauwalder (4) as Survey Director for the Pennsylvania School for Blind Children, launched a major study on "Education, Training and Employment of the Blind." The study was nationwide in scope, analyzed the results of questionnaires returned by the largest residential schools, the State Departments of Education, the 21 largest city school districts, and the Federal and State Vocational Rehabilitation agencies. The study included a follow-up of graduates of the Western Pennsylvania and other schools for the blind. Among the findings were the following major problems:

"We found adequate vocational counseling personnel, either as related to numbers or to qualifications, in fewer than 10 percent of the residential and day schools studied." (4, p. 177).

"The various academic and college preparatory curricula offered by the residential schools for the blind throughout the United States have been well developed and meet the needs of students who will go to college. On the other hand, occupational and vocational curricula have been almost non-existent and the few schools offering business education have not geared their programs to the needs of employers." (4, p. 175).

"A very minor percentage of referrals for service [to the vocational rehabilitation agency] has been made by schools, either residential or day. Ranges in the several states have averaged from 1 to 3 percent of the total referrals for service." (4, p. 122).

"Most of the alumni [from several residential and day schools] have felt that they should have received more service from the school or agency offering

counseling, guidance and placement. . . . it is important that there be further cooperative interrelationships developed between the schools and all agencies in order to assure the amount and type of service required by the average student and graduate." (4, p. 163).

### Unwittingly Increase Cleavage

It must be clear from these quotations that the noted deficiencies (and only a few are mentioned for illustrative purposes) are not due to a one-sided partnership. The problems are numerous, complex and demand a high level of productive cooperation in both fields in order to lead to satisfactory solutions.

Unfortunately, the modes and content of training for special educators and for rehabilitation personnel unwittingly are geared to increase the cleavage rather than to narrow or eradicate it. Rehabilitation counselors are being trained in university settings in basic general principles and practices. They generally learn about the special problems of blindness only after they leave the university, that is, while they perform on the job, and in agency training institutes. These training efforts deal almost entirely with the services and setting of the individual public or private rehabilitation agency. Seldom does the training cover intensively the knowledge of overlapping and complementary functions between special education for children and rehabilitation for adults.

In the same general way, the direction and content of special education frequently encourages a form of in-breeding and concern for its own area. The primary targets of instruction are the psychology of learning in childhood and early adolescence, special teaching methods, the socialization of blind students in early years of schooling, and a curriculum which is concerned largely with academic activities.

### "Hangovers" From Recent History

The attempts to bring about real, meaningful cooperation must reach into and include the preparation and up-grading of professional personnel in institutions of higher learning. The instruction must include a plan that is widely accepted by leaders of both fields for salutary changes in current conditions. Otherwise, present deficiencies will be perpetuated, or the attempts to change will be haphazard, subject to the personal preferences of professors, and resisted by practitioners in both fields. Some universities, such as Columbia University Department of Special Education (5), are exploring the overlapping spheres of education and rehabilitation with support from VRA. Although the experience is modest, it is a start if we can use what we know, and sensitize the facilities to the reciprocal needs of their training programs.

There are unfortunate "hangovers" from recent history which get in the way of productive cooperation. One of these is the philosophy of "comprehensive self-containment", in other words, the special educators sought, not many years ago, to establish a full comprehensive program for their students from early childhood into adulthood, job-placement and follow up. The purpose was good, but the ideal could not be realized for many reasons, including short financing.

The rehabilitation agencies fell victim to the same hopeless ideal of "comprehensive self-containment" until the teamwork concept inexorably made its



impression in the early 1950's. The writer remembers one instructor at a training course for counselors in the late 1940's saying, "If rehabilitation can't do the whole job alone, it is a failure." This attitude was heard at least as frequently among special educators. Rehabilitation, too, had realistic problems of financing. The demands of the adult blind were so great in numbers that the agencies could not cope with them. The agencies were overwhelmed and could not serve the needs of adolescents still in school. This condition no longer should be true today.

### Application of Rules of Reason

Considerable difficulty also arises from a lack of appreciation that we cannot turn out perfect human beings, no matter how much we try, when we deal with the imperfections of our human nature. Rehabilitation counselors would like to have adolescents and young adults perfectly prepared to assume full and broad adult responsibilities. Employers would like to have perfectly prepared employees who can carry out their jobs with distinction. Special educators would like to see all the promise of their charges translated into productive living quickly and effectively. These are excessively high hopes.

When one hears a rehabilitation counselor say, "These schools just don't prepare their students realistically for work and adult living," one cannot help but think, "Just how much can students develop realistically for their age, in view of the realistic conditions (and deficiencies) in education, home and community?" Similarly, special educators and employers have to apply rules of reason in their respective expectations from rehabilitation. Unfortunately, all parties are speaking partial truths when they say that persons with visual handicaps are not being given as good an education, and rehabilitation, and productive employment as it is possible to give with all the imperfections of the adults who perform their respective work.

In a more subtle form, the excessive distance between schools and agencies is being justified by seemingly disparate philosophies. These principles, specious in some and yet true in other ways, provide each side with intellectual and moral armor which hardens fundamental positions under the shibboleth of "progressive realism". In concrete form, one will hear some special educators say, "Rehabilitation is fine but our job is one of Habilitation." The typical rehabilitation worker doesn't relish such apparently fine distinctions and regards them as additional display of stand-off-ishness.

### Theoretically, Difference Is Valid

On a theoretical plane, the difference is valid. Habilitation proposes that the education of the congenitally disabled should be based on a series of developmental sequences natural and normal for such children. For the latter it is necessary to determine the natural stages of development, to build upon them in a positive way, one stage leading to the next in a smooth progression. However, the word "normal" is not used in the usual sense as applied to the non-handicapped.

Moreover, habilitation does not, in its pure sense, apply to all children in special education classes. Some may have been non-handicapped in early years. Some may have not conformed to the theoretically normal developmental sequences, due to factors such as maladjustment of the person or his family, or

slowness in school subjects, or the presence of additional handicaps and impairments, or the inability to accept the handicap and its concomitants, or even the difficulties of adjusting to non-handicapped children in the regular-class placements.

Rehabilitation, in its pure sense, intends to convey the broad concept that the person previously was normal in all respects and non-handicapped; then, deprived of useful vision, he had to learn an entirely new mode of living to re-establish himself among his peers as the same human being fundamentally though impaired in accidental-human features. However, in practice, rehabilitation provides useful services to the congenitally impaired. At the age levels when education and rehabilitation overlap, there are broad similarities in purposes, aims, services and in the basic philosophy of maximum personal development and full participation in normal avenues of social interaction.

Although the distinction is valid, in that habilitation is a more appropriate concept for the early years of childhood, and rehabilitation is strictly speaking more appropriate as a special program for people blinded in adult years, there is no justification for continuation of current minimal forms of cooperation between special education and rehabilitation. At the overlapping areas during the periods of adolescence and young adulthood, due account must be taken of the person as he is and the results of the education that he has received. Although there are differences between the congenitally and adventitiously impaired, the plan of services is geared to each individual and is, therefore, not affected by an dichotomy in classification, as valid as it may be.

### Forms of Cooperative Efforts

This paper frequently has referred to residential and day schools for the blind. We intend to include other arrangements for education. Cooperative efforts in such other arrangements may be even less effective at the present time.

Ashcroft (6) describes six general types of educational plans for the education of the visually impaired encompassing the total range from the partially seeing to the industrially and the totally blind:

1. Regular classroom with seeing children, with few or no special provisions;
2. Itinerant teacher or contact plan which provides periodic direct services to the visually limited children, and indirect services to the children through their regular teachers and other school personnel;
3. Resource teacher plan in which the child attends most regular classes and goes to the room of the special resource teacher for special help and materials;
4. Cooperative teaching plan in which more comprehensive help is given to the child in the special class, particularly in braille reading and writing, in typing, and in mobility; the child attends regular class in those subjects which involve no special conditions or activities;
5. Special or self-contained class where the children receive all their instruction under a special teacher;



6. Residential school plan with a self-contained program solely for visually limited children.

Ashcroft notes that the present trend is toward the development of a continuum of educational programs rather than dichotomous services among day and residential schools.

### Grouped Under Three Headings

The evidence from the literature and observations of the current scene indicates that "cooperative agreements" between schools and rehabilitation agencies take widely variable forms. For convenience, the cooperative agreements may be grouped under three main headings:

1. Discrete Cooperation, that is, the school claims full responsibility and provides all services to the student up to, or very close to his graduation. Then the person is referred to the agency which now assumes total responsibility. The school makes its records of the student available to the agency upon request, and is available for consultation. However, educational plans and rehabilitation programs do not involve substantial inter-consultation.

2. Consultative cooperative plan, that is, the rehabilitation counselor is included as a consultant in student-evaluative discussions, has access to school records, and may introduce himself to the student a half year or more before graduation. However, counseling and all other services are provided by school personnel during his stay in school. When the person leaves school, the rehabilitation agency assumes full responsibility but may call upon educational personnel as consultants.

3. Flexible coordination with shared responsibilities, that is, the school and the agency become full-fledged members of the "community team" (rather than the school team). The community team makes comprehensive evaluation and a plan to which all agree, and have shared responsibilities. This team is concerned with the student while he is in school, perhaps as early as age 13 or 14, long before he is expected to leave school.

### Suggested Features of Flexible Coordinated Plan

Team Roles. In this writer's opinion, there are a few crucial matters in executing a flexible coordinated plan. Where there are residential or day school or special classes for blind students, a representative of each of these should take the leadership in setting up and providing space for the community team to meet from time to time on matters dealing with their own students.

When the visually impaired students are in other settings, the public rehabilitation agency should assume leadership for the community team. Also, the agencies represented on the community team should understand that responsibilities will be shared, and that their role is not solely consultative. Furthermore, the coordination for each blind student is put into operation at about the time he is 14 years of age, or earlier as the situation dictates for special reasons, and continues until he makes adult adjustments, or moves elsewhere.

Probably the school supervisor of guidance, or the district supervisor in the public agency should have the responsibility for the operation of the

community team. The members of the team for individual cases will change, at least to some extent in keeping with special needs. For example, if a student needs medical services, or psychiatric treatment, or a special course at a rehabilitation center or a vocational training facility, or mobility training at another facility, the appropriate representative will be requested to join the coordinated effort.

The team should be brought together only for significant group deliberations and formulation of plans; otherwise, the professional person who is the logical coordinator for the individual case will be responsible for dovetailing suitable persons and services at the appropriate times. Telephones and letters should be used to expedite matters, and sometimes a few people can meet to settle interrelated matters. We are not suggesting a highly formalized team operation, but a coordinated operation which is flexible, effective and reasonable to all concerned.

### Comprehensive Evaluation

The coordinated plan requires that a broad evaluation be made of each student, usually on the freshman or sophomore level of his high school education. The evaluation should include medical, family, psychological, social, educational, vocational and other components of each individual's makeup. When the comprehensive data are collected by various members, the team should come together with the intention of formulating a definitive evaluation and a long-term plan for execution. The team should agree on the major aspects of the evaluation, and on roles to be assumed by individual members in seeing that recommended services are obtained.

### Counseling

It is imperative that the student and his family be actively involved throughout the process. The team will have to decide who is in the most logical position to carry out the counseling. Perhaps the school counselor will be responsible for personal-educational matters, the rehabilitation counselor for the vocational phases, the social worker or the school counselor for the relationship with the family.

Usually one person is in the best position to take focal responsibility, either because of a congenial relationship with the student or because of his paramount needs. The arrangement includes the possibilities of holding group counseling sessions for students or for parents. More could be done than is presently being attempted in group counseling; the establishment of the community team could encourage increased activities in this area. When the evaluation has ascertained the need for medical, psychiatric or other forms of service, this may be provided according to prearranged plan.

### Vocational Exploration and Training

Here again we see the possibilities for increased efforts, through the stimulation of a community team. The operations of rehabilitation centers and multi-purpose rehabilitation workshops have highlighted the values of broad psychological evaluations, and the use of work samples and job tryouts. When the schools are in a position to set up and operate classes in vocational exploration, they may be used by students in or out of the school as the facility



is able to accommodate them. Otherwise, the schools may arrange to release students to be exposed to vocational-exploration experiences at nearby community facilities. Summer work experiences may be arranged through the joint efforts of the school, rehabilitation agency, state employment service and employer-groups. Perhaps vocational training may be arranged in regular schools for appropriate students. College-readiness sessions may be set up during the summer for students who could profit from them. Work-study programs during the terminal school years may be tried more systematically.

### Mobility Training

According to the Dauwalder study, about 90 percent of the residential and day schools for the blind believed the schools should provide mobility training. (4, p. 32) This does not mean that mobility instructors should be on the school staff, but it is obvious that there is widespread agreement on the necessity for at least beginning instruction for students while they are in school.

There is considerable variation of opinion on the most suitable time and the content for pre-mobility and mobility instruction. This attests to the need for demonstration and research projects (7) that will provide recommended if not definitive answers in the next ten years. The mobility instruction may be furnished on the school grounds, or in rehabilitation centers by cooperative arrangements with agencies able to furnish it. A dearth of competent personnel is a complicating factor and calls for careful inter-agency planning.

### Evaluation for Adult Living

As we have pointed out, initial comprehensive evaluation usually should be made in early high school. Another: "adult-readiness evaluation" would be most desirable as the young adult readies to leave high school or when he is soon to look for employment. At this teamwork session, the emphasis is placed on the person's ability to undertake adult responsibilities in the broad context of the community. This is a time for checkup, to make sure everything possible has been done, to do more if it is needed, so that the client is prepared as fully as possible. The person should be ready for employment, community responsibilities and satisfying leisure-time activities. All avenues for possible employment are involved, or sought. There may be impending courtship or marriage interests and the budding appearance of concerns for eventual family roles. These changes may usher in a new phase of maturity, new motivations and attitudes.

### Job Placement and Follow-up Counseling

All avenues of assistance for placement must now be actively mobilized. This is usually a time of considerable fluidity for the client as the prospective jobs make their appearance with many accompanying problems and decisions. After job placement, there should be a follow-up with the client, and probably with his employer and key supervisors. New agencies may have to be contacted for additional services, and yet, the whole approach should encourage a maximum of self-propelled activities by the adult person himself.

Counseling may have to take account of long-standing problems in attitudes and personality makeup as the stresses of adult living are encountered. As

information is available on progress in adult living, it should be fed back to the community team and to school and rehabilitation agencies. Such feedback of information is much too accidental and incidental in present practice.

### Changes Imperative

It must be clear from the contents and suggestions of this paper that changes will have to be made in many places, if a more effective program of flexible coordination between special education and rehabilitation is desired. The changes may require modification in the educational curricula, in the composition and quality of rehabilitation agency services, and perhaps in the pattern of community facilities. These changes will have to come not alone from the needs of the blind but the community circumstances as well. We may expect to cope with problems arising from automation, from the long-term ills of society such as poverty, shifts in population, in urbanization and suburban living, the increasing use of leisure, and the fluctuating attitudes of society toward the fullest possible participation of the blind. These expected changes in the patterns of personal and social living mean we cannot maintain programs as they are now.

The task for leaders in special education and rehabilitation is to reevaluate current forces and conditions, and to formulate guidelines for the realization of a more effective common mission in behalf of our blind students and clients.

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# VOCATIONAL REHABILITATION ADMINISTRATION GRANT PROJECTS IN ISRAEL

*By Berthold Lowenfeld, Ph.D.*

## INTRODUCTION

The Vocational Rehabilitation Administration, Department of Health, Education, and Welfare, has since August, 1960, supported research in rehabilitation in foreign countries. Projects in this program are supported with grants from so-called counterpart funds, that is, with American-owned foreign currency derived from the sale of United States agricultural surpluses in foreign countries.

"The general purpose of the Vocational Rehabilitation Administration International Rehabilitation Research Program is to stimulate more countries to initiate research and demonstration activities that will solve some of their own particular rehabilitation problems and contribute to rehabilitation knowledge both in the United States and overseas." Public Law 86-610, the International Health Research Act, provides for the exchange of specialists and experts in rehabilitation between the United States and the participating countries. The three projects in Israel, reported here, have been conducted with grants from counterpart funds under the Vocational Rehabilitation Administration International Research Program.

Miss Mary E. Switzer, Commissioner of the Vocational Rehabilitation Administration, asked the writer of this article to visit Israel for approximately six weeks (October-November 1965) for the purpose of discussing with the project directors and their staffs the present status of their research, and discussing with other interested persons in the field of work with the blind any problems on which they may want to consult with him. Mr. Joseph M. LaRocca, Chief, Division of International Activities, Vocational Rehabilitation Administration, provided valuable assistance in the preparations of the trip, and Mrs. Zivia Chayot, Director, Service for the Blind, and Mrs. H. Kahn, Head, Foreign Relations Division, both of the Ministry of Social Welfare, gave their congenial and expert assistance to the writer while he stayed in Israel and visited institutions engaged in the projects and in work with the blind in general, throughout the country.

The writer wishes to extend his sincere thanks to all persons named above and to the many people who gave him such a kind reception in this new country with whose ambitions he has felt a strong tie, ever since the days of his youth.

## Rehabilitation of Visually Handicapped Persons as Data Processing Machine Operators

This project, supported by the International Rehabilitation Research Program of the Vocational Rehabilitation Administration, is sponsored in Israel by the Ministry of Social Welfare, Jerusalem, Israel, in cooperation with the Office of Mechanization Centre of the Ministry of Finance, the Educational Department of the IBM World Trade Corporation (Israel Branch), and the Jewish Institute for the Blind, Jerusalem.

Mr. Yehuda Schiff, Director, Rehabilitation Division, Ministry of Social Welfare, is the Program Director and under his guidance I had an opportunity to visit the locale of the project and to learn about its inception, progress, present status and outlook for the future.

Israel, under its Law of Return, has admitted without any selection blind persons from all over the world. Before the foundation of Israel as a State and during its first years, the immigration came mostly from European countries and from those parts of Asia which were under Russian, first Czarist and then Soviet, domination. In the last fifteen years, most of the immigrants came from Asia and Africa, particularly from the countries under Arab domination, most of them deficient in education, lacking regular working habits, and culturally deprived.

The Ministry of Social Welfare, through its Service for the Blind, of which Mrs. Zivia Chayot is the Director, has had the responsibility of providing assistance, social work services and rehabilitation to Israel's blind population. Under her leadership works a staff of social workers, placement agents and other personnel who provide a variety of services to the blind.

While the services for the blind had to concentrate, after their inception in 1958, on those blind persons who had dependent families and those who were older people but capable of benefiting from training programs, the past few years have produced an increasing number of graduates from regular high schools, or capable non-graduates who, for one or another reason, did not finish high school.

In Israel, as in many other western-oriented countries, industry and commerce increasingly make use of automation, and this forced training facilities for the blind to look out for job activities which a blind person can pursue in this field. The success of many blind telephone switchboard operators who are employed throughout Israel, made them more confident that a properly trained blind person with certain technical, logical and mathematical capabilities could function well in the data processing field.

Israel is, and has been during the past years, in a period of industrial expansion which created a manpower shortage and made employers more willing to use blind persons as workers in industry and commerce. However, there was no precedent in Israel of any employment of a blind person in the computer field. It should be mentioned here also that until now Israel industry and commerce have made use of conventional computers rather than electronic computers. The latter are just beginning to be ordered and accepted.



Though knowledge of the training of blind people as computer programmers in the United States and of some experiments with handicapped people in the computer field in Switzerland had reached those in Israel interested in the rehabilitation of the blind, planning for the new venture was difficult.

According to Mr. Schiff, "At the outset of this programme we were confronted by severe and unpredictable problems. Before even approaching the problems with the blind themselves, we had to find appropriate teachers and instructors, specialists in the IBM field, who were capable of instructing the blind. These were not available and we had to persuade regular IBM teachers to cooperate in the project by promising them guidance and assistance from our specialists in methodics for training blind persons and in vocational rehabilitation counseling to overcome obstacles pertaining to teaching blind people."

A first experimental group of blind students — the term "class" would not have been justified because everything was lacking: teachers, methods, and curriculum — was formed and the experiences with this group led to a meeting attended by the instructors and vocational rehabilitation counselors and also by specialists in IBM machines and managers of three IBM installations in Jerusalem. The experiences with the experimental group were presented to them and they concluded, "that a blind person was capable of operating all machines in an IBM installation except the accounting machine, and is also capable of installing the panel wiring for all machines, including the accounting machine."

These preliminary experiments and their results were presented to the Vocational Rehabilitation Administration in the form of an application for a Project Grant which would assist in opening new occupations for the blind in the computer field, not only for the blind of Israel but for those in many countries all over the world. The request for a grant to establish a demonstration center for "Research on Rehabilitation of Blind and Visually Handicapped in Operating IBM Punch-card Machines" was approved by the American authorities. Also, the IBM World Trade Company recognized it as an "Educational Project" and contributed by allowing a sixty per cent reduction in the rental of the machines.

The research project aims at four goals:

- (1) To compile a manual for teachers and instructors on how to teach blind people the theory and practice of operating IBM machines and panel wiring;
- (2) To train blind persons to perform all operations according to the methods they have been taught, to do their work efficiently in a minimum of time, and to operate the maximum number of machines of different types;
- (3) To devise special aids and features which will make the blind operator independent in his work;
- (4) To set up standards and criteria for abilities, education, etc., required of a student in an IBM operating course.

When I came to Israel in October 1965, the third course was in progress and out of sixteen students who attended and finished the first two courses, thirteen had been placed in IBM computer work with banks, with the municipalities in Haifa, Jerusalem, and Tel-Aviv, and two with the IBM Corporation.

The trainees who graduated from the courses receive IBM certificates which are valued by their future employers. IBM personnel has cooperated closely and with great interest in the program and has a special supervisor in its training department for the project who also acts as consultant when needed. One of the former trainees was employed by the project as an instructor in the third course. The project also includes the training of deaf girls as card punchers.

Besides these remarkable achievements, there are available two extensive reports submitted to the Vocational Rehabilitation Administration.

The first report includes, mainly, a detailed description of IBM machines and their functions; of the principles on which IBM equipment operates, and a job breakdown of the IBM 083 Sorter. The second report reviews the achievements in the training of blind persons in automatic data-processing, validating the conclusion that the blind person can perform productive work as a punch-card operator. It describes some special instruments which were constructed to aid the blind in the performance of certain operations for which vision is indispensable and of others where tangible arrangements must replace those arranged for visual operation. It also gives a sequence of lessons and exercises which, though not significantly deviating from a syllabus for sighted students, presents some adaptations for use with blind trainees; and it also includes a consideration of future trends in automatic data-processing, particularly the introduction of a programming course for the IBM 1401 Computer.

The second course, attended by ten trainees (four of them totally blind, four partially sighted, one with heart disease, and one a post-cerebral palsy case), expanded the teaching program of the first course by including additional subjects; new models such as Sorter 083, Collator 88, and control panel wiring for the Accounting Machine 407.

Another five blind trainees participated in a programming course for the IBM 1401 Computer, two of them graduates of the Hebrew University with BA degrees. It was originally planned to bring these trainees up to the level of sighted junior programmers. However, experiences with this small and heterogeneous group do not allow for any definite conclusions concerning the length of time and the training methods for such a course.

One of the graduates of the first course, who is employed as an operator in a bank, participated experimentally in a regular computer programming course for sighted people conducted by the IBM Company. A member of the research staff of the project was with him for the whole period to assist him and also to study training methods with consideration of their application to the blind. This blind trainee has above average aptitudes and reached an above average level in the examinations given as a part of this programming course.

The graduates of the first two groups who, as Mr. Schiff points out, have gone with the staff through all trials and errors, serve now as the best source for advice on new problems and difficulties, and how to solve them. The project is arranging regular meetings with those who attended the previous courses at three monthly intervals, to evaluate training received, and to discuss and find solutions for new problems which arise in the course of practical work.



Mr. Schiff discussed with me the future expected development of data-processing in Israel. He and his co-workers believe that conventional machines will continue to be used in smaller enterprises while it is most likely that larger IBM installations will be replaced, either partially or wholly, by electronic computers. He also foresees that conventional installations will continue to be used in other parts of the world, particularly in the developing countries. Therefore, it appears to be advisable to continue the training of conventional machine operators.

At the same time, changes in equipment will make it necessary to retrain project trainees in the use of the new and more advanced equipment, and also to provide higher level training for programmers of electronic computers. For this purpose, some of the already employed trainees have returned to the project for one to two weeks in order to be brought up-to-date on changes of equipment in their firms. The employer paid their wages for the time of the retraining.

The IBM Computer 1401 will be used for teaching beginners and Computer 1460 will then be used if the employer progresses to a more complicated machine. IBM Computer 360-20, the basic new machine, is smaller and actually easier to operate than the others. Though all these computers are based on the same principles, they are sufficiently different to demand retraining. Computer NCR-315, a product of National Cash Register, has already been introduced at the Social Security Center and in the Internal Revenue Center. Since this machine is produced by a different firm, more extensive retraining for its use will be necessary. There are only four teachers for this computer in Israel and the project was, at the time of my visit, looking for one who could instruct the blind in the use of this machine.

At present, the trainees are given the following three stages of training:

- (1) Conventional machine operation.
- (2) Control panel wiring for conventional machines.
- (3) Programming for electronic computers.

In order to achieve success in this training, the number of trainees per class needs to be limited to five and the duration of the course will be for one full year. Also, since graduates must reach a high level of achievement, their ability and educational requirements need to be higher than those required from sighted candidates for equal courses.

Mr. Schiff took me through the complete course facilities and some of his associates showed me some of their past trainees at work. At present, the facilities are housed in a rather old building which had to be rewired. They will most likely move into new quarters, a part of the Jewish Institute for the Blind in Jerusalem, where a special wing has been built and wired for the exclusive use as a Data-Processing Training Institute. Showing me some of the computer trainees at work met with difficulties, because during most of the time of my stay in Israel all computer personnel was on strike. Nevertheless, the supervisor of the governmental Office of Mechanization Centre, where one blind programmer and one blind operator are employed, was so interested in demonstrating the work of his blind operator that he and two of his co-workers

came to the Centre in order to demonstrate the modus operandi of the blind operator. I observed him doing the wiring of a panel for a conventional machine, sorting punch-cards with the aid of a special instrument, and, in general demonstrating very convincingly his abilities and his usefulness in this computer center. The supervisor went out of his way to tell me how satisfied he was with the work results of his blind employees.

Since the operation of conventional machines and of electronic computers is steadily increasing, manpower requirements for computer operation and programming must also be expected to increase. The project in Israel serves to provide the blind with an opportunity for participation in this specialized field and also demonstrates how these opportunities can be provided in other developing countries of the world.

The Israel project has much in common with the VRA supported American project "Training of the Blind for Professional Computer Work," conducted at the University of Cincinnati under Dr. Theodor D. Sterling. However, it seemed to me that the Israel project is mainly concerned with the training of blind persons for work as computer technicians, while the University of Cincinnati project concentrates on preparation of programmers. Accordingly, the former trains mostly blind high school graduates, while the latter prepares blind college students. Working in the field of data-processing involves many levels of skills and competence. Knowledge and experience gained in each of the projects can be used by the other so that ultimately a full range of preparation in data-processing will be provided in each place for the capable and interested blind person, leading to employment on the level for which his skills and capabilities are best suited.

### Training of Blind Workers for Employment in the Textile Industry

This project, supported in part by the International Rehabilitation Research Program of the Vocational Rehabilitation Administration, is conducted by the Ministry of Social Welfare, Jerusalem, in conjunction with the Industrial Department of the Israel Institute of Productivity (Textile Unit), Tel-Aviv, Israel. Mr. David Amir, Director of the Textile and Leather Section, Israel Institute of Productivity, was my guide on my visit to the Arie Shenkar Textile School managed by ORT (Organization for Rehabilitation through Training), in Ramat-Gan, a city adjoining Tel-Aviv. Mr. Amir is the principal investigator of the project.

In traveling through Israel, one cannot help but notice the large areas of land where cotton is grown. This cotton is utilized by a network of spinning and weaving factories which are to be found in many parts of the country. Their products fill the local demand and are also used for export. The textile industry is steadily expanding with the employment rising from the present 24,600 workers to about 30,000. It is one of the top industries of the country and there is a shortage of workers who would be willing and able to perform certain necessary operations in the factories producing textile goods.

The Ministry of Social Welfare has placed some individual blind workers in a number of larger factories in the country. They had received some preliminary training at "Migdal Or," the Rehabilitation Center for the Blind near Haifa. These placements were successful and encouraged the authorities to engage in a more systematic approach to the selection, training and placement



of physically fit and manually capable blind persons in certain phases of the textile industry.

The project consists essentially of two parts: (1) Research on methods of training blind workers in certain operations in the winding process. (2) Establishment of a center for the training of blind people in certain phases of the textile industry. The results of this research and demonstration project will be valuable in supplying trained workers urgently needed for the expanding textile industry in Israel, but may also have usefulness in similar industries in other countries where the textile industry is expanding.

On my visit to the Arie Shenkar Textile School, I was told that they are now conducting the fourth course for blind trainees in operating a cone-winding machine, with seven participants. Of the total of thirty-eight past trainees, about thirty graduated and are employed; eight finished but were not able to work full-time, standing on their feet and operating the machine. Though this record is an eminently satisfactory one, Mr. Amir stressed that they expect to improve it by a more thorough selection of trainees, based on accumulating experience in the prerequisites for such employment.

The training course is essentially the same as for seeing trainees, although certain changes and adaptations in the working process are necessary. Winding machines, such as the one used for training purposes at the Arie Shenkar School, are a massive piece of machinery more than thirty feet long on which the onlooker sees a long row of cones and threads, the former ones in continuous rotating motion. The machine does the cone-winding job and the duties of the operator are threefold: (1) Replacing empty supply bobbins with full supply bobbins, (2) replacing fully wound cones by empty ones, and (3) tying the thread when it breaks and restarting the bobbin to cone thread connection when the cone is fully wound. Although these operations sound rather simple, they involve a multiplicity of movements and actions, each of which poses problems and can be done either in the correct manner or faultily, and with essential movements only or with unnecessary ones also.

The main problem of the blind worker as compared with his seeing co-worker is that, while the latter can see with one glance over the entire area for which he is responsible whether a thread is broken or a bobbin or spool runs empty, the blind worker has to determine this by touch. In fact, he walks from one end of the length of the machine assigned to him to the other, feeling with one hand for any broken threads which may also indicate to him empty bobbins or full cones, and holding in the other hand the mechanical little knotting device into which he has to place the two ends of the broken thread while the device does the knotting. It can easily be recognized that the *modus operandi* of the blind workers must be somewhat slower than that of sighted ones.

The Israel Institute of Productivity, Industrial Department—Textile Section, has compiled two reports, one entitled "Directives for Preparing A Course of Lessons in Detail for Training the Blind in Winding Work," and the other "Programme for Teaching the Manual Operations Required for Operating a Cone Winding Machine." The first mentioned report deals with the explanation of the work to the trainee; gives a breakdown of manual operations required for operating a winding machine and directives for learning each operation separately; describes the Cone Winding Machine; and the manual operations

carried out on the winding machine. The second report describes the structure of the training program; gives the contents and layouts of twenty lessons and the distribution of hours of instruction; gives a list of equipment and auxiliary aids required in the training course; and finally, a job breakdown of the twenty-one operations involved in the job.

With this instruction program, a blind worker can be trained on the most common type of winding equipment used in the Israel spinning mills, such as the "Leesona" (made in U.S.A.) and the "Schlafhorst" (made in Germany) machines. Instruction at the Arie Shenkar School follows essentially this program. Included also is a tentative list of those basic qualities which the blind trainee must possess in order to be able to compete with the operator having normal sight. The blind trainees I saw, men and women, appeared to be an eager and well-motivated group, some of whom had already reached considerable efficiency in performing their work. They were a mixed group so far as their countries of origin are concerned; some of them obviously came from Arabian countries.

As a result of the project, a survey "Examination of the Prospects for Placing the Blind in the Weaving Industry as Knotting and Tying-in Operators" was prepared for the Ministry of Social Welfare by the Israel Institute of Productivity, Industrial Department, Textile and Leather Section, in June, 1965. Mr. Amir explained that this survey is a part of an evaluation of the prospects of placing blind workers in pre-weaving occupations and that the study was conducted in six cooperating weaving plants. Knotting or tying-in is one of two forms for the final preparation of the warp, before fixing it on the loom. These operations are far more complex than yarn winding, since any mistakes made in winding do not show and result solely in a certain increase of waste, while the faulty drawing-in or missing of a yarn is quite damaging, considering the resulting flaw along the whole length of the cloth which is prominently visible. This survey reviews existing conditions in the tying-in of unplied yarns and in the knotting of plied yarns; it gives a detailed analysis of operations performed by the right and the left hand; and finally, a long chapter presenting "A Method for Instructing the Blind in Knotting and Tying-in Operations." This last chapter was done with the assistance of Mr. I. Evangeles, a blind instructor.

In view of the recency of this survey, there are not yet any reports available on actual experiences with the manual knotting and tying-in work with which it deals.

When I was in Haifa, I visited Ata, the largest textile factory in Israel. It employs eleven blind spoolers and also two blind telephone operators. The spoolers were the only men among an almost exclusively female working crew. First, I was shown through parts of the factory and we stopped for longer observations in those places where blind spoolers were employed. There were rows and rows of cone winding machines and the blind workers were distributed at various places. They were immediately recognizable, not only because they were the only men, but also because they were walking along the machine feeling the threads with one hand and stopping whenever they had to perform any of the previously described operations. The seeing women did this by watching the threads and moving only toward those spools where they saw a broken thread, a full spool or an empty bobbin. Some of the blind operators worked with amazing speed and skill, while others were somewhat slower. Such differences I also noted among the seeing employees, perhaps not so noticeable.



On the way back to the office of the department head who showed us around, he insisted that we must also see Schmul, their most efficient blind telephone operator. He stressed that the work of both blind telephone operators was far better than that which previously employed seeing female operators performed. But Schmul, he said, is really exceptional. When I met him at his telephone switchboard, he greeted us with a short "Shalom," interrupting when he had a breathing pause. I noticed that he had lost two fingers on his right hand, as I was told, in an explosion during Israel's War of Independence, which also destroyed his sight. He operated the switchboard with amazing skill and speed and his verbal replies were prompt and always to the point. My guide told me that he has the additional asset of a phenomenal memory for telephone numbers and besides cheerfulness, he also brought to his job an absolute reliability.

When we had returned to the office of the department head, he gave me additional information about the eleven blind spoolers. He said that, in general, their maximum efficiency runs to about sixty to seventy per cent of that of seeing workers. They have the same basic wages but receive only sixty to seventy per cent of it plus a ten per cent "efficiency premium." They work for eight hours and make Israeli Pound 1.70 an hour.

When I asked him why they employed blind spoolers who were found to be somewhat less efficient than seeing ones, he said that they have other assets, such as work steadiness, low absenteeism, no shift difficulties (night shift is readily accepted), and they have very good relationships with their female co-workers. He thought that the sixty to seventy per cent efficiency could be raised if machines were especially adapted to the blind. He also mentioned that they moved about very well, from their dressing rooms to their working place, all of them having had mobility training. When shift change came, we met some of the blind workers outside their dressing room where they mingled with other male employees of the factory, joking and readily conversing with them.

My impressions at Ata were very favorable, particularly since I was told that all blind employees, even if their wages were somewhat below those of the seeing workers, make a reasonably good living, as wages in Israel go.

It can be expected that with improved training and perhaps with adapted machinery, the blind workers' efficiency will be raised so that the wage differential between him and the seeing spoolers will be reduced or almost eliminated.

The expansion of the textile industry in Israel will provide further employment opportunities for the blind, not only as spoolers but also in other phases of the production process.

Mr. Amir also discussed with me his plan to prepare blind people for certain work in the leather industry, particularly in the braiding of leather strips for sandals and summer footwear.

In the United States, many of the occupations in which the blind were gainfully employed are phasing out largely as a result of automation. This is particularly the case in the production-line industrial opportunities. The machines which are used in the textile industry in Israel are also used in the United States, especially those which are made in the U.S.A.

The experience in Israel suggests that with appropriate training facilities for the blind, their placement in certain phases of the textile industry might be quite feasible. At least an inquiry into this possibility should be made in order to determine the necessary basic facts. In addition, the relatively large number of blind persons employed in Israel as telephone switchboard operators suggests the search for activities which are in demand and require similar skills.

In Israel, the Ministry of Social Welfare purchases switchboards which are specially designed for use by blind operators, and places them with various agencies and firms who, in turn, obligate themselves to employ only blind operators for their use. This requires a comparatively large initial investment but it pays by providing continuous employment for a blind person on a competitive salary level. Although telephone automation is much more advanced in the United States than it is in Israel, the principle as such may be applicable in other fields of employment in the U.S.A.

### The Israel Institute for Orientation and Mobility of the Blind

The International Rehabilitation Research Program of the Vocational Rehabilitation Administration gave a grant to the Israel Foundation for Guide Dogs for the Blind (now the Israel Institute for Orientation and Mobility of the Blind,) in cooperation with the Jewish Institute for the Blind, the "Migdal Or" Rehabilitation Centre for the Blind and the Ministry of Social Welfare. The principal investigator of the study is Professor Dr. Rudolphina Menzel, the Director of the Institute and a Professor of Animal Psychology at the University of Tel-Aviv. Dr. Menzel has had long experience in the training of dogs and guide dogs.

"The aim of the project is to study and evaluate the importance of orientation and mobility in the rehabilitation of the blind and to investigate the main differences between the born blind and the blinded in regard to their capacity for orientation and their ability to reach freedom of movement. — Orientation shall be defined as 'ability of an individual to recognize his surroundings and his temporal and spatial relations to himself.' The study will also concern itself with the psychological and social adjustment to his environment and to his success or failure on the job which includes relationship to the community, the family, colleagues, etc., and their relationship to him. — Mobility refers to travel efficiency, i.e., frequency of travel, extensiveness (or distance) of travel, and independence of travel."

What I have said in a different context holds true particularly in Israel: "At a time when blind people were confined to residential schools, to special workshops, and generally to a life-space restricted by the concepts of the seeing world concerning the effects of blindness, there was no great need for mobility. . . In our days when many blind children go to public schools, blind students attend colleges, blind people are trained for and pursue many kinds of work and take part in all phases of communal life, there is an urgent need to develop their mobility potential to its fullest."\*

In old Palestine, before Israel's statehood, the blind were, indeed, largely confined to a segregated life, most of them and the institutions for them were supported by charitable organizations and establishments. The new Israel, though it made its mistakes, developed and accepted a different attitude toward the blind which accorded to them an education essentially equal to that of the

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\* Lowenfeld, Berthold. "The Social Impact of Blindness Upon the Individual," New Outlook for the Blind, November 1964, pp. 273-277.)



seeing, increased work opportunities in industry and commerce, and an equal place in society.

Israel, with its growing population and with its rapid and ever-increasing industrial development, has at present very difficult transportation conditions, with too small and too few highways and too much traffic. In addition, working places are often located at considerable distances from residential facilities because of the concentration of industries in certain areas.

Israel is a country of immigrants who come from a variety of cultural and educational backgrounds. At present, as in the immediate past, the main influx comes from Oriental countries where the cultural and educational patterns often did not provide any education for their blind population. Thus, people who were born blind or became blind later in life may not have become used to employing their senses for orientation and mobility while they lived in these countries of their origin. For seeing people who are young, the schools in Israel and particularly the Israeli Army in which service is compulsory for all, male and female, serve as a medium of acculturation. The young man or woman may enter the Army as a Yemenite Jew or Moroccan Jew but when he leaves it, he is an Israeli. Rehabilitation agencies in Israel, and particularly the rehabilitation centers, have the additional task of this acculturation above their aim of assisting people to become adjusted to their handicap. The Ministry of Social Welfare and the Ministry of Education, as well as other governmental agencies, are quite well aware of this responsibility for all of their newly immigrated citizens.

The Israel Institute for Orientation and Mobility of the Blind is located in Kiryat Chaim, north of Haifa, within short walking distance from "Migdal Or," the only Rehabilitation Centre for the Blind in Israel. It is within easy reach of a large city (Haifa), of industrial and residential sections, and of a rural environment. The Institute has a modern and functionally well-designed building in which the offices and the students' quarters, including kitchen facilities, are housed. They can accommodate up to fifteen trainees at a time. It has up-to-date kennels and the necessary open space for the training of dogs as well as for the training of students and of student-dog teams.

Besides Dr. Menzel, I also met her trainer staff and those who are giving some of their time to mobility instruction by the use of the long cane. During my stay, they did not conduct any training but Dr. Menzel told me that they are conducting extramural activities with some of their students, in the area surrounding their domiciles and/or their places of work.

Up to approximately two years ago, the Institute worked with guide dogs only. Since then they have expanded their work to include cane travel instruction as well. As instructors, they are using some of the fourteen trainees who took part in the course for mobility instructors held by Mr. Harold Richterman of the Industrial Home for the Blind, Brooklyn, N. Y., who was sent to Israel for this purpose under the auspices of the Vocational Rehabilitation Administration.

During the last year, thirteen man-dog units have completed their training. Additional work with dogs and their masters was required in different parts of the country due to various reasons, such as, change of domicile, change of place of work, etc. Thirty-nine blind adults have received cane travel instruction in various parts of the country. A mobility course for six school children attending classes in a Tel-Aviv public school, was held at the Institute with a follow-up of travel instruction in their places of living.

The Institute has also started to provide mobility instruction for some blind Arab Israelis in Acco and particularly in Nazareth in a Catholic institute. I had the pleasure of meeting, in Dr. Menzel's office, a nun from Nazareth who had come to discuss some problems in orientation and mobility training with her and her staff. This is the first time that any mobility training has been made available to blind people as a group belonging to the Arab minority in Israel. The Institute also supervises the mobility training for the older students at the Jewish Institute for the Blind in Jerusalem. At regular intervals, refresher and discussion meetings are held at the Institute with all mobility instructors participating.

The Institute has a cooperative arrangement with the rehabilitation center. "Migdal Or." Before graduation, all trainees of the rehabilitation center are examined as to their efficiency in mobility and, if necessary, they are given additional mobility training before they finish up their rehabilitation training at "Migdal Or."

After they return to their home communities they receive additional instruction which familiarizes them with their environment, with the way to their places of work, to their social worker, to the shops and to other places which may be important to them. Since their bodily safety is involved, the Institute stresses that this must be done by trained mobility instructors. The Institute also issues monthly leaflets for its graduates and for its instructors; it participates in a variety of conferences and keeps in touch with all related organizations. Its director, Dr. Menzel, and other staff members participate in conferences and pursue those functions of information of the public which are usually performed by special agencies of the blind.

In December, 1963, the Institute received a grant from the Vocational Rehabilitation Administration, the purpose of which has been described before. In this research, they are selecting some 300 blind people who are considered as able to move freely with a cane, a dog, or otherwise. They are collecting information about each of these individuals, his personal data, his level or education, his economic situation, his appearance, a description of his place of living and of his living conditions; then they take an inventory of the efficiency of his remaining senses and of his capacity of orientation, indoors and outdoors; they assess his intelligence, his sociability, his aptitudes, and report observations concerning his emotional life. On a separate form, they evaluate the changes since the individual obtained mobility instruction by recording the blind person's own observations, the opinion of the family, and, if possible, reactions of others concerning the effects of this change. The investigator adds his remarks about the changes since the client has obtained mobility instruction and evaluates the extent of the individual's mobility. Questions are asked about the changes in his way of life after mobility instruction, how his vocational training and general education was influenced by it, and what effect it had on his social activities and his recreational pursuits. Finally, the investigator sums up all observations.

In order to give the investigation a homogeneous character, the research will concentrate on the totally blind only, who are classified in three groups: (a) blindness from birth; (b) blindness caused by disease; and (c) blindness caused by injury (including war injuries). So far, material has been collected on over 160 blind individuals in various parts of the country. Dr. Menzel stressed the importance of later extending the investigation to those who are partially



seeing, because she is convinced that they have unique problems in mobility also.

The decision which of the two aides, dog or cane, should be selected for the individual blind person is made with consideration of all elements in the blind person's physical, mental, and emotional makeup, of the surroundings in which he lives and works, and, of course, also by considering his own personal preference. The Institute is in the unique position of being able to provide all presently accepted kinds of mobility aids to its blind clients.

Dr. Menzel states optimistically: "Now we can begin to cover the whole country in order to give the maximal number of blind people in various parts of the country maximal freedom of movement." In addition, she plans a continuous supervision of all blind people who have received mobility instruction by regularly checking up on their efficiency in mobility and assisting them if and when corrections or improvements appear to be necessary.

The Israel Institute for Orientation and Mobility of the Blind is unique in that it provides in one place training in the use of dog guides and in the use of the long cane. In such a setup, the selection of the individually most suitable mobility aid is made with the assistance and advice of a staff that is expert in both mobility media.

There is as yet no such facility available in the United States where the decision about the training in one or the other technique is largely left to the individual blind person and his preferences or idiosyncrasies, with some more or less objective information added. Personnel in the dog guide schools as well as those engaged in mobility instruction give advice on and arrange mutual referrals, but this is usually done after the blind person has begun his mobility training in one or the other medium. A facility combining dog guide training and long cane mobility instruction would, in addition to its services, also offer opportunities for experimentation and for much needed research in this field.

## Conclusions

The three projects which were described are directly contributing to the rehabilitation of a considerable number of blind people in Israel. Their existence and the experiences which result from their conduct and from the research which they pursue will stimulate and assist further developments in Israel and will serve as examples and patterns for similar undertakings in other developing countries in Africa and Asia. But besides these very substantial values, there is one which should be particularly emphasized. Theodor Herzl, the founder and father of modern Zionism, wrote a utopian novel in which he described the future Jewish state as he envisioned it in 1902. He gave his book the title, "Altneuland" (Oldnewland).

There are, of course, many things and institutions in Israel which remind you of the old, some most valuable as parts of the Jewish tradition and history, others obstacles in the path of newly developing ideas and institutions.

The three projects which the Vocational Rehabilitation Administration supports in the field of work with the blind are an enormous force in moving the position of the blind in Israel society from the charitable old to the productive new, from the segregation-oriented past to the integration-oriented present, from that of protected dependency to that of responsible freedom.





# PLACEMENT - KEY TO EMPLOYMENT

*By George A. Magers*

Access to an opportunity to work, coupled with a fair chance to receive equal consideration for jobs, is the bedrock on which our American system of private enterprise is built.

To obtain the means with which to compete for employment in a changing labor market is the desire and the duty of all blind persons who have the capacity and ability. To provide these means is the responsibility of our society. These are the precepts underlying the philosophy of restoration and utilization of human resources so fundamental to vocational rehabilitation.

## Campbell's Ideas Seemed Too Radical

For hundreds of years concepts concerning the disabling condition of blindness have limited an individual to economic dependency. While it is true that we could find isolated examples of a departure from these concepts and social attitudes, it has been only recently that the idea of enabling an individual to use his residual skills and ability has received real consideration. Even after much effort was put forth to educate and train blind people, there was a considerable lapse of time before the idea of an aggressive placement program came into being.

Barely a century ago such a program was envisioned by the young Francis Campbell, one day to become an international authority on blindness. But his ideas seemed too radical to his fellow Americans. After one dramatic experiment and demonstration, he took himself off to prove what he had in mind in another land, while a great heaviness settled on work for the blind in educational fortresses, where there was a kind of open secret about "not knowing what to do with them after you've educated them."

This generation of American workers for the blind appears to have succeeded altogether in forgetting Campbell's spectacular venture in the vocational training and placement of the blind, a key figure in which was Hannibal Hamlyn, Vice-President of the United States during Lincoln's first administration.

## "Trusty And Well-Beloved"

Ironically the only record of this significant episode in the maturing of America is testimony given on May 8, 1886, before Queen Victoria's commissioners on "The Blind, the Deaf and Dumb." This body, which made a report to both houses of Parliament, had names like the cast of a Gilbert and Sullivan opera: The Duke of Westminster; The Bishop of London; Sir Lyon Playfair. But the hero of the piece was the American expatriate, Francis Joseph Campbell,

LL.D., who had been living away from his native land seventeen years, during which time he had acquired such regard among the British as to be described in the Queen's English of the report as "trusty and well-beloved."

In the verbatim quotes of his testimony he begins by telling that he persuaded Dr. Samuel Gridley Howe of the Perkins School to select 20 children with mathematical aptitude for training as musicians, since he believed such aptitude could be made the foundation for competent, though not highly talented performance in music. Campbell insisted on absolute authority over their regime (including ice-skating) through the course of what turned into an 11-year experiment.

Coming to the placement aspects, he spoke as follows: "I do not quite like telling my secrets out of school, but I think it will help you to appreciate my principle of action in regard to getting employment for the blind if I go back now to my original class at Boston, and show you how I began getting employment for them.

#### Found Bangor, Me, Likely Site

"The name of my first pupil who was ready to go out was Reeves. He was one of the boys whom, as I have mentioned, I had selected. When he was ready to go I had been looking out for various places; in fact it is always principle with me when I take a holiday, whatever village I go into, to find out everything that is going on there. I find out whether there is any possible chance of my placing there an organist or a pianoforte tuner or whatever it may be. I never wake up or go to sleep without having in my mind where I can find employment for my blind boys and girls.

"Now I had been the previous summer to Bangor, in Maine, and I had made up my mind that it was a wide-awake town, and that it was all right. I went to Dr. Howe and I said to him: 'Now, doctor, this boy is trained, but the work is only half done. Here is one pupil that I want to get employment for. If we say to him, 'Well, Thomas, we are very glad that you are so well prepared, and we shall be delighted to hear good things of you, be sure you write and tell us how you get on,' and do nothing more, it is nine chances to one that he will fail. What we must do is to give him the benefit of the influences of this institution. Here is an influential board of directors; here is the governor of the commonwealth who is nominally at the head of the institution; here is the great influence which you yourself can bring to bear. We must establish this boy, we must have a certain amount of money, and we must really start him!'"

"The doctor said: 'I have no money, either public or private, which I can use in such a way.' The fact is that the doctor refused to help in the business. I then went to a friend of mine, an English gentleman, a Mr. Lyman, and told him what I wanted. He very cordially said: 'Well, I believe you are right; I believe it is the right principle, and at any rate if you will undertake it I will share half the loss if there is any loss. Try and see if you can start your young man.'

"I wrote to my friend at Bangor, and I received a reply to this effect: 'My dear sir, we have only so many thousand people here (it is not a very large place, about half as large as Leicester), and we have 16 music teachers here already. I advise you to go to some small place where a blind teacher would not have to encounter competition, and where he would have a much better chance of success.'"



## Arranged Meeting With Mayor

"I wrote back to say that the very fact that there were 16 teachers there showed that there was a good deal of teaching, and that we were coming and expected to get our share of it. Consequently we arrived at Bangor, and I had a letter of introduction to Mr. Hamlyn, and letters of introduction to a number of other people. My friend who had written to me first in regard to the number of teachers that there were in Bangor, and pointed out that there was such competition and advised us to go elsewhere, called the next morning. There had been a very heavy snowstorm, and he came in while we were at breakfast at the hotel. "'I want you to go with me to the mayor,' I told him.

"'To the mayor,' he repeated, 'the mayor does not know anything about music.'

"'Never mind,' I said, 'you do not mind going with me to the mayor and introducing me to him.'

"'Certainly not,' was the reply.

"We called on the mayor, whose name was Dale.

"I said, 'Mr. Dale, I want you to give a party, and to invite my young friend Reeves and me to come to it, and to invite also as many influential ladies and gentlemen as you possibly can, and let me see what can be done.'

"The mayor agreed. I said, 'We will play and do a variety of things, and towards the latter part of the evening I want you to ask me to explain how a blind man can teach seeing children music.'

"He had the party, and I did explain the whole subject; and I at once got a committee appointed, a very influential committee, of which Mr. Hamlyn was the chairman, to arrange for a large public meeting. Mr. Hamlyn wanted me to take a small hall that would seat about 150 people, but greatly against his wish I insisted upon taking the largest hall there was in Bangor, which seated about 1500 people.

"Then I got the invitations in the hands of 40 ladies, and of course I kept those ladies going.

"When Mr. Hamlyn came to the hall the place was so full he could not get in at the door, and he had to come in at the artistes' door, and we gave him an armchair on the platform near the piano.

"The sixteen music teachers in Bangor were all seated in front to see what these innovators were going to propose.

## Teachers Wound Up Taking Lessons

"We gave a very spirited performance, in which I myself took part. We played on two pianos, and Reeves played the organ, and I showed how he could teach, and I explained the different theories. "Then I said, 'Now if any lady or gentleman here has any children who are willing to be taught, and are willing to try an experiment for three months, we are quite prepared to take such children on this condition: that if you are not thoroughly satisfied at the end of the three months with the manner in which the instruction has been given, and with its results, there shall be no charge whatever; but if it is satisfactory the charge is to be so-and-so;' and I named a price entirely above that of every teacher in Bangor.

"Before I left the platform I had all the teaching that I wanted for that young man. He began with a very large class, and within less than six months, nine of the 16 teachers in that very place were taking lessons from him. In that first year he earned \$1200.

He remained there until I went abroad for my health, and then I got him to come to Boston to take my place, and as I remained abroad he became permanent director of the musical department of the blind institution at Boston, and he holds that position today."

#### Sought President Cleveland's Aid

Campbell was shrewd enough not to mention on this occasion that his originality of approach produced a negative reaction from his colleagues, who were unable or unwilling to do likewise. He went to Europe more ill in spirit than in body. Dr. Howe, always broad-minded, continued his friend, but some of his other fellow workers were cold toward him, even in his old age. Except as a visitor, he never came back to America while making a spectacular success of his placement activities in connection with an educational program in Britain.

Once the Illinois School for the Blind attempted to secure him as superintendent and once he himself obtained an interview with President Grover Cleveland to persuade Cleveland to establish a National Program for the Blind. Neither effort was successful.

It took another generation of Americans to learn his wisdom from one of his most apt pupils, his son Charles Campbell, who returned to America to be a prime mover in establishing the Massachusetts Commission for the Blind, and its adjunctive experimental station, the purpose of which was to propel blind workers into the vocational world at large, rather than to deposit them in an isolated setting for the handicapped.

This effort and other activities with which the Campbells were associated brought into being a climate of ambition for blind people in which the first generation of full-time, convinced placement specialists of the blind were able to keep each other's courage up long enough to demonstrate the feasibility of the idea that blind workers may mingle with the sighted. Though he left work for the blind, Charles Campbell stayed long enough to declare that Joseph Clunk was the placement man par excellence.

#### Principles Tested and Found True

Since the late 1930's the concept of developing methods and techniques for placing blind persons in competitive employment has come to the forefront through the leadership and willingness to develop teaching materials, as well as through actual successful placements by a number of outstanding individuals who shall not soon be forgotten. A few of the old masters such as Joe Clunk, Hiram Chappell, John MacAuley and Art Voorhees have given to many in work for the blind throughout the country the necessary impetus to continue to press forward in the business of putting qualified blind people in jobs alongside their sighted peers.

The basic elements developed during the training programs held during the 1940's for vocational rehabilitation personnel having the responsibility for



placing blind persons in competitive occupations are every bit as valid today as they were at the time of their conception. Our training programs in this area now are built on these principles which have been tested and found true, as evidenced by the more detailed description of the era by Joseph Clunk which is a companion piece to this article.

#### Laid Foundation For Training Courses

Eight six-week courses were held for the purpose of training counselors in the placement of blind persons in competitive employment during the 1940's under the direction of Mr. Clunk who at that time was Chief, Division of Services to the Blind, in the Vocational Rehabilitation Administration (then the Office of Vocational Rehabilitation).

At least 72 individuals working in the different State programs were involved. The curriculum for this six-weeks' training program developed by Mr. Clunk and his staff and carried out by the Division of Services to the Blind laid the foundation for succeeding training courses held during the 50's and the current program now being carried on at Southern Illinois University at Carbondale.

These courses involved the concepts of placing properly qualified blind persons in selected employment as well as the necessity for gearing the approach to meet employer needs. This continues to be primary for any successful program placing blind persons in competitive employment whether it is in industry, in clerical or sales, or in service occupations. In fact, these concepts are paramount to any placement program of severely disabled individuals. One of the significant effects to result from the placement training courses held from 1943 to 1948 was the development of potential leadership material for the future vocational rehabilitation of blind persons in the United States.

Out of these eight training courses many public and private agency administrators and supervisors received their preliminary orientation into work for the blind. Just to cite a few such State Directors as Dr. Norman M. Yoder, Commissioner, Pennsylvania Office for the Blind; Donald Perry, Supervisor, Division of Services to the Blind in Utah; Travis Harris, Chief, Services to the Blind in Oklahoma; George Keller in a similar position in Maryland, are alumni of these training courses. Others were Aubrey Tipps, Field Supervisor for the Texas Commission for the Blind; Claude Tynar, Chief, Division of Services to the Blind in Colorado; Ned Cox, Director of the Kentucky Workshop for the Blind; Jack Raithel, Supervisor, Placement, Missouri Bureau of Services to the Blind; all in administrative or supervisory positions in State agencies having the responsibility for the vocational rehabilitation of blind persons.

On the national scene, Dr. Douglas C. MacFarland, Chief, Division of Services to the Blind in the Vocational Rehabilitation Administration, and Mr. M. Robert Barnett, Executive Director of the American Foundation for the Blind, were also students in Mr. Clunk's training program.

Many others are continuing to function as placement counselors or consultants throughout the country. A few are Ed. Rieman, Missouri Bureau for the Blind; Harry Runnion, California Department of Vocational Rehabilitation; Octave J. Bourgeois of the Louisiana Division of Services to the Blind; Leon Feldman, Pennsylvania Office for the Blind; Griff Eastin, the Georgia Division of Vocational Rehabilitation.

## Survey Funds Granted in 1958

During the 1950's primary attention with regard to the vocational rehabilitation of the blind was given to the development of adjustment and prevocational training resources with a somewhat diminished concentration on training programs for placement personnel.

However, in 1958 funds were granted to the American Foundation for the Blind for the purpose of surveying potential training resources for counselors in a university setting. At the conclusion of this survey Southern Illinois University was recommended as the location for the setting of a long-range training program for counselors having responsibility for placing blind persons in all types of competitive employment with the exception of the professions. Southern Illinois University, Vocational Rehabilitation Institute, submitted a long-term training application with the first course to commence in the Spring of 1959.

Although modifications were made in specific aspects of the curriculum, the basic approach used in the 1940 training programs was used in developing the course at Southern Illinois University. Subsequent changes have been in line with changing labor demands and improved techniques in client preparation and employer approaches. For example, originally the Southern Illinois University course was six weeks in length. It has been found that through careful planning the course can now be contained in a five-week program. Many other innovations have been made since the original course in April of 1959. At the present time 23 such training courses have been held, providing training for more than 260 counselors and related personnel engaged in placing blind persons in employment.

### Example of Placement Training

The following outline of the curriculum for the 22nd five-week training course at Southern Illinois University can serve as an example of the nature of present day placement training:

#### Developing Employment Opportunities for Blind Persons in Competitive Occupations

22nd Session — Winter, 1966

Patterns of Management (Five 1 1/2 hour sessions)

Salesmanship, (Five 1 1/2 hour sessions)

Job Analysis With Respect to Blindness (Five 1 1/2 hour sessions)

Shop Work (Group Divided into four sub-groups)

|                                                |                           |
|------------------------------------------------|---------------------------|
| Machine Shop (Three 3 hour sessions per group) |                           |
| Wood Shop (Three 3 hour sessions per group)    |                           |
| Cafeteria                                      | } (1-1/2 hour each group) |
| Bindery                                        |                           |
| Greenhouse                                     |                           |
| Laundry                                        |                           |
| Data Processing                                |                           |
| Ordill Training Center                         |                           |



Relationship With Organized Labor (One 1 1/2 hour session)

Developing Employer Relations (Five 1 1/2 hour sessions)

Special Problems in Placement (Four 1 1/2 hour sessions)

Counseling For Job Readiness (Five 1 1/2 hour sessions)

Developing Community Resources (One 3 1/2 hour session)

Field Work (Twenty 4 hour sessions)

Relationship With Community Agencies (One 1 1/2 hour session)

It is interesting to note that in the most recent training courses a few individuals are moving into leadership roles in the vocational rehabilitation of the blind. Some of these are Liman De'Andrea, Administrator of the Rhode Island Program of Services to the Blind; John Parsons, Supervisor of Services to the Deaf and Blind in Alabama; Joe Wiggins, Supervisor of Rehabilitation in Virginia; Vernon Broussard, Assistant Director in Louisiana; Randy Green, Supervisor of Training, Texas Commission for the Visually Handicapped; William James, John Horst and Vince Iacurto, District Managers in the Pennsylvania Office for the Blind. However, the great majority of students attending the Carbondale courses continues to carry out functions as counselors in the State agencies providing vocational rehabilitation services to the blind.

#### Trend Shifted in Recent Years

In the placement training program developed in the 1940's, emphasis was placed on personnel specializing in industrial placement activities. State agencies throughout the country established positions where primary responsibility was for employer contacts and the actual placing of blind persons on jobs. These responsibilities did not ordinarily require the carrying of a caseload. However, in recent years the trend has shifted to the counselors having total responsibility for a caseload from referral to placement. In the majority of instances States are now requiring their counseling personnel to perform the total vocational rehabilitation counseling job.

Another significant change which has been noted is in the fact that in the early placement activities, persons who are blind were hired for placement specialist positions. In reviewing the makeup of the counselors attending the placement training program during the past six years, a balance of sighted and blind counselors has been the rule rather than the exception. Hiring authorities are not primarily concerned with sight or the lack of it but are more interested in the individual's ability to perform the job. While serving as a demonstration of what blind people can do is the distinct advantage of blind vocational rehabilitation counselors, the over-all job duties are so balanced that in many instances, sight, if it is coupled with the requisite training and ability, may facilitate the performance of the duties.

#### Working With the Rural Blind

Individuals who are blind and who have the competency to perform as counselors are still in high demand and are competing on an equal basis with sighted

counselors working in similar job situations. In many instances the two have been teamed together in order to derive the greatest possible advantage.

During the late 1940's under the leadership of Hiram Chappell, courses were developed for the purpose of training counselors having the responsibility for working with the rural blind. Four-week training courses were held at the Academy for the Blind, Macon, Georgia, Kansas State University at Manhattan, and at Cincinnati, Ohio. In conjunction with this training program aimed at teaching the methods and techniques of establishing blind persons in rural activities, a number of one-week refresher courses were held.

In 1962 with the rapidly changing farm economy it became evident that a careful study of counselor training activities with regard to the rehabilitation of the rural blind was necessary. A contract was made with Kansas State University for a survey of successfully rehabilitated blind persons on farms and in rural activities. One of the results of this project was a series of recommendations indicating that the establishment of blind persons on small family specialty farms was no longer practical from a vocational rehabilitation standpoint. The large outlay of capital demands big business resources. This has greatly limited the economic soundness of the small farm.

### Growth in Non-Farm Opportunities

While no further training courses in this area have been planned and none are contemplated within the foreseeable future, the Vocational Rehabilitation Administration felt it necessary that training in the methods and techniques for rehabilitating the rural blind must be a part of the over-all program for counselors having the responsibility for placing blind people in competitive employment.

Farming activities have expanded greatly and have become highly automated; nevertheless, there are many specific job situations which, if a blind person is properly trained, can be performed on a competitive basis.

Along with this development in agriculture, there also has been a growth in rural non-farm opportunities for which blind clients can be prepared. In the late 1950's it became obvious that with the expanding opportunities for blind persons in professions, specific training programs for counselors having placement responsibility for this group of individuals should be developed.

The Vocational Rehabilitation Administration made a grant to the Pennsylvania Office for the Blind for the development of short-term training courses to be offered to counselors having a concentrated responsibility for professional placement. These courses were of two-weeks' duration. However, with the growing demand for short-term training funds, the professional placement training course which was held in the Spring of 1966 was shortened to one week. Still, the basic curriculum developed by the Pennsylvania agency was used. Simultaneous with the development of the short-term training program for professional placement, a study of more than 400 successfully employed blind persons in professional occupations was carried out and resulted in the development of important literature not heretofore available.



## Hope For Definitive Recommendations

As a part of the over-all concern for the training and placement of blind persons for employment, a similar study patterned after the professional program is now in process and will be completed with the publishing of two volumes in late 1966. This project is concerned with the success factors in the employment of more than 1,000 blind persons in industrial, clerical, sales and service occupations. It also includes detailed interviews with a large number of employers hiring blind persons as well as vocational rehabilitation counselors who have been involved in their placement.

It is hoped that one of the results of this study will be definitive recommendations for future planning in training programs for counselors who have placement responsibilities.

In surveying the results of placement activities over the past two decades, progress is evident when we note that the number of blind persons rehabilitated has increased five-fold. An even more significant sign of progress is in the wide range of occupations in which blind persons are now employed. In 1965 for example, 5,450 blind persons were rehabilitated.

## Large Growth In Last 10 Years

The following figures show the varied nature of the program of selective placement: In the professions 327 individuals were employed, in such jobs as lawyer, teacher, chemist, science analyst, social worker and psychologist. Semi-professional placements such as business agents and managers totalled 622. Six-hundred and eight blind persons were successfully employed in clerical and sales positions. Service occupations, one of the most rapidly growing opportunities for employment, totalled 704. Semi-skilled (machine operators, assemblers, packers, etc.) included 399 individuals rehabilitated. Skilled (machinists, quality controlled personnel, etc.) numbered 344.

The unskilled occupations showing a slight decrease over previous years totalled 242 rehabilitants. Agriculture and kindred occupations following the national trend decreased to 316. Through the State-Federal Vocational Rehabilitation Program 3,562 blind persons secured employment in competitive occupations in 1965. This indicates a growth of well over 60 percent in the past ten years. Out of the 5,450 rehabilitants, 484 were employed in sheltered workshops and 1,404 were shown as housewives, homemakers and other unpaid family workers.

With the recognition that the vocational rehabilitation counselor must metaphorically switch hats when he assumes the employer contact responsibilities of his job, the very nature of the vocational rehabilitation program is client-oriented and the sequence of rehabilitation services must be directed toward assisting the individual in achieving his vocational goal. This is true in all services; except selective placement where the counselor must change his approach and consider employer needs. A modern day approach to selective placement as it has evolved over the past 20 years, must, of course, have well prepared merchandise to present to prospective hiring authorities. However, such preparation invariably must match the needs of the labor demand.

## Basic Steps For Consummating Job

In planning placement training programs for counseling personnel, five basic steps are necessary in consummating a job for a client. These are:

1. Pre-approach — This involves a careful survey of employment opportunities in the community covered by the counselor. It also requires the collection of such information as the type of products manufactured, the power structure within the different concerns, labor demands, employer attitudes, the nature of jobs to be done, location of businesses and industries, and many other factors.

2. Approach — This is primarily the initial employer contact and the counselor must become a salesman. He first must obtain the employer's attention, his interest, his understanding, his commitment, and finally close. In training placement personnel in the earlier courses much attention was given to a list of employer objectives and suitable answers. However, in the more recent courses a positive approach of presenting to the employer those factors which would be an asset to his company and meet his particular labor needs, have received much consideration. Positive reasons for employing a blind person must hinge up on these needs and the attributes of the potential employees; for instance, an outstanding safety record of other blind persons employed in similar occupations. Agency backing is another prime factor with regard to the employer's concern. One of the primary unspoken fears of many employers is: "If he doesn't work out, how will I get rid of him? Because I couldn't fire a blind person." The agency providing the selective placement service can be of tangible support to both the employer and the employee in this regard following closely the progress of the worker as he goes on the job, continuing a liaison followup in somewhat the same manner as a reputable manufacturer would back his product. Careful screening and vocational preparation is another positive element which can be offered to prospective hiring personnel. Morale, employment stability, dependability, adequate production and loyalty are a few of the other factors which are illustrative of the positive concept of presenting blind persons for employment.

3. Job evaluation and demonstration — This, of course, is extremely important to the selective placement process in finding the proper job for the right individual.

4. The fourth step involves the actual placement itself wherein the counselor takes the blind person to the job, assists in his orientation to his surroundings, and as support to personnel, foreman and trainers in initiating the employee to his work.

5. The fifth step is that of follow-up in order to give satisfaction to the employer and to aid the employee in meeting the demands of the particular work involved. It also has the effect of protecting opportunities and in many instances leads to the development of new ones.

### Must Be a Good Listener

In order to carry through the five steps in the placement, the counselor must be knowledgeable in management organization, labor relations, job processes, the demands of the day, and even more important, future demands



which might arise. This latter factor must take into account potential for advancement, changing job situations, and over-all employer needs in the short and long period of time.

In his relationship with the employment community, the counselor not only must present his case in a forthright positive manner, but he must be a good listener, careful to follow both what the employer is saying and what he is leaving unsaid.

With the goal of enabling every blind person to secure employment who has the ability, interest and desire to work, we must plan for tomorrow and for many years to come. We must develop a cohesive approach to placement plans for the future. Simultaneous efforts on many fronts must be a prime element in our over-all plans. Our technology is changing so rapidly that we must give an ever-strengthening consideration to the vocational preparation of blind persons preparing to enter labor market.

### Need for Ground Work By Counselor

While placement in the professions is somewhat different from the approach used in competitive employment such as industry, clerical and sales, service and agriculture, there are many instances where doors must be opened and questions must be resolved.

Organizations employing professional personnel expect as a part of the applicant's qualifications his ability to present his story and meet the questions of the interview. Nevertheless, greater success can be achieved if ground work has been done by the counselor prior to an individual's initial interview. In the preponderance of instances this will involve questions of a policy nature.

Once an affirmative policy has been secured, a blind applicant for a professional position will have equal opportunity along with other prospective employees. In the area of professional employment, we must plan for specific positions. For example, educators tell us that there will be a high demand for the teachers in the elementary and secondary schools throughout the country for many years to come. In order to prepare those blind persons who have the ability and training to perform in this capacity, we must bring together those tools of selection, training, and placement essential to meet the individual needs.

### VRA Sponsors National Institute

Another example involving future planning is that of the drawing together of criteria for the selection, training and placement of computer programmers.

During the past three years the Vocational Rehabilitation Administration has sponsored national institutes aimed at investigating specific occupations in depth. To date these efforts have been primarily in the competitive employment field. The national institute for the selection, training, and placement of medical records transcribers and that for PBX operators has developed valuable tools which counselors are using in their day-to-day activities.

A third such national institute was held in May of 1965 and gave special attention to the employment of blind persons in unskilled and semi-skilled jobs in hospitals. On a demonstrative front, the project at the North Dakota State

School of Science aimed at demonstrating the feasibility of providing trade-technical training to blind persons from a particular region, has been highly successful in that five of the six graduates to date are now employed in industry using their machinist training in their day-to-day jobs. Similar pilot programs must and will be a part of our over-all selective placement program.

If our estimate of 400,000 blind people in this country at the present time is valid, and from all indications we are convinced that if anything it is conservative, then the figure of 40,000 newly blinded each year is a reasonable assumption.

Examining the age distribution, number of multiply handicapped and individuals motivated for employment, as well as those willing to accept training to meet job demands, there are at least 10,000 newly blinded each year who have a potential for vocational rehabilitation. This means that at the present time, we are doing slightly more than 50 percent of the job.

If Vocational Rehabilitation is to keep pace with fellow service agencies and organizations and related programs aimed at assisting man, then it must set its sights and gear operations to double results, not in the next decade, but within the immediate future. We must plan to meet the competition for jobs in the changing labor market in the same manner that innovations and mechanization are accelerating our entire social economic way of life.

We are not confronted with a scarcity of job opportunities for our clients, since each year our economy is actually producing more new jobs than there are new workers coming into the labor market. Rather, these jobs are of a nature for which our clientele is not prepared. Automation, as we have come to call it in this country, does not necessarily mean a reduction in the total labor force. It does, however, indicate a shift in the nature of work and a change in our social economic way of living.

### Shift To Service Occupation

For example, in the early 1900's, employment in the United States was based on a rural economy. We have seen this shift with the development of the tools of production to an urban way of life with fewer and fewer individuals required to produce the population's food. The perfection of hybrid seeds and the development of equipment for intensive agriculture have played a part in this change along with plans for mass production of consumer items.

Now we are noting a different shift, or change. Forty-five years ago, relatively few Americans had full-time employment in service occupations. However, today, with the advent of automated means of production, with increased leisure time and an easy flow of money, at least one of 10 workers in our country has his primary job in providing service.

It is most probable that this change will continue until the year 2000, when one of every five individuals will be engaged in service occupations or in service industry. We would like to cite a few examples of occupational areas in which we have already commenced planning, but in which we need to continue these efforts, especially in regard to the selection and training of blind persons.

In 1960, the service industries stood in fourth rank among employers, providing jobs for more than 6 1/2 million people. These millions were working in



such diverse places as auto and other kinds of repair shops, laundries, dry cleaning establishments, hotels, barber shops, theaters, movie production and advertising firms.

The service industry group also has been one of the fastest growing and is now well over three times its size in 1919. This reflects a very important fact about our way of life — that as we grow and prosper, higher and higher proportions of people will be engaged, not in making things, but in performing the multitude of services that make life more pleasant and easier for people generally. In the next 15 years, it is estimated that there will be at least 4 1/2 million more service jobs ranging from the unskilled to the highly technical and professional job.

### List of Employment Opportunities

The following are just a few of the examples of service occupations in which blind persons are currently employed: flatwork ironer (extractor, loader and puller), dishwasher, linen sorter, bakery-icing machine, dairy tending and offbearing, medical transcriber, stock room work, garments presser and turner, telephone answering service, blueprint machine operator and tourist guide.

Other employment opportunities in service industry which are being filled by blind persons throughout the country are as follows:

1. Laundromat Attendant - This job is an outgrowth of an ever-increasing demand for a special intensive service on the part of individuals using the equipment in this type of business enterprise. The laundromat attendant must have the qualities of a salesman, clerk, and maintenance mechanic. He sells laundry supplies and other cleaning products. He must maintain records of the financial take of the equipment, and he must be able to do at least minor repair work when one of the machines breaks down. For any person this will require training; for a blind person, it will require a carefully planned intensive training program. This training cannot be casual or short term if the blind person is to become a competitive employee.

2. Baby Sitter — In the present day and age, when many housewives are working in the competitive labor market, the occupation of baby sitter, if properly managed, can pay at least a minimum wage. A number of blind persons are working on a part-time basis in this area and some are making it a full-time job.

3. Piano Tuner — At the present time, the average age of piano tuners throughout the county is well above 60. This group earns, on the average, more than \$100 per week. Relatively few individuals are taking training in piano tuning. This is even more sharply noted in the lack of interest on the part of blind persons. A primary reason, of course, is the tremendous expansion in access to different opportunities in the last 20 years. Nevertheless, for those individuals who are blind and who have the interest and ability, piano tuning and repair is still a lucrative service industry.

4. Automatic Transmission Repairman — Automatic transmission repair work can offer employment for blind persons, especially in situations where the units are removed from automobiles and/or trucks and brought to a repair center. In some instances, other phases of the automobile repair service industry

offers employment opportunities for the trained blind mechanic. In most instances, these jobs are highly specialized and limited to specific tasks. The blind person working as a general mechanic is the exception.

### Good Opportunities In Hospitals

For many years, hospitals have found it difficult to fill their unskilled and skilled jobs. This continues to be the fact. With the requirements of the forthcoming medical care under Social Security, the number of hospital beds, of necessity, will increase 50 percent in the next ten years. This is not taking into consideration the required new facilities brought about by population growth. For example, the arrangements for packing various laboratory and surgical trays are becoming highly mechanized, especially with regard to wrapping and sterilization. The dispatching of small instruments, prescriptions, etc. by means of the electrical tube to the various stations in the hospital is another instance where technology is facilitating efficiency. While some jobs are disappearing in the central supply departments of hospitals, new ones are developing.

In dietetics, too, there are a number of positions for which blind persons can be trained, jobs such as operating the automatic dishwashing machine, stripping dishes, feeding the glass washer and many others which mechanization is continually changing.

Individuals who have the educational background and have been trained for the necessary skills will be in demand in an ever greater quantity for the next several years. Another occupational area deserving our attention with regard to future planning is the rural recreational industry. It is estimated that this rural industry will be employing full time 1.4 million individuals by 1980. This means an increase of over 700,000 new jobs in the next 15 years.

### Chances For Transcribing Transcripts

In the majority of States a number of employment opportunities for trained and qualified blind persons as transcribing typists have been developed during the past few years. This is not only true for the larger populated States, but a number of such job situations have been found in the smaller State governments. The demand for the trained typist who can use the sound equipment continues to exceed the supply. Transcribing typists jobs are found in both the stenographic pools of large agencies and in the smaller government installations. Blind persons are competitively performing typing functions which involve dictation for narrative material, letters and, in a number of instances, the completion of forms. The latter job situations must be analyzed carefully with regard to the materials to be typed.

### Special Examinations Offered

In many of the Federal installations throughout the country blind persons are currently employed as transcribing typists. Upon completion of their training they have made application and taken the Federal Civil Service Examination for clerk typist and have been employed.

The Civil Service Commission has developed special examination procedures for blind persons for the position of transcribing typists, and upon notification, will make the necessary arrangements for the administration of these tests. Coordinators for placing the handicapped in the different government



departments have been especially helpful in locating transcribing typist positions. In such metropolitan areas as Washington, New York, Chicago, St. Louis, etc. there continues to be a healthy demand for trained and qualified blind transcribing typists.

### Medical Transcribers Are Sought

The training requirements for blind medical records transcribers is somewhat more involved than the training of a transcribing typist. However, the basic skills are primarily identical. The medical records transcriber must have a thorough knowledge of medical terminology as well as the ordinary typing skills.

The need for medical transcribers throughout the country is evident when we consider the fact that more than 7,000 hospitals registered with the American Hospital Association treated 27,501,997 patients in 1963. From these figures, it is estimated that 20,000 transcribers will be needed.

Any hospital with between 25 and 50 beds could use one full-time transcriber. An added 5,000, bringing the total to 25,000, would be needed to include those hospitals which record physical examinations, case histories, consultations, social service reports, and so on. There is an additional area for medical transcribers outside the hospital field, in doctors' offices, insurance companies, pharmaceutical laboratories, and local, State and Federal agencies.

In surveying hospital situations in the different sections of the country, we have found that in virtually every instance, there are open job opportunities for the blind medical records transcriber.

In assessing occupational information with respect to the employment of blind persons, we have learned of a relatively large number of blind persons who are employed as typists in various commercial and industrial enterprises. These range from large manufacturing corporations to insurance companies and small business enterprises. There are a few instances wherein the job of receptionist is combined with the typing position.

### New Jobs In Telephone Industry

While the number of telephone operators employed is rapidly going down, the number of craftsmen in this industry is going up. This, coupled with the expansion of new services, new systems of communication and equipment, is today causing a stable level of employment. While in the next ten years telephone exchange operators will probably decrease by two-thirds, employment in the total industry will be increased. If there is not a radical change in our social economic pattern, employment in the communications industries will grow with the expanding population in this country.

There are many jobs which soon will no longer exist, but there will be completely new jobs for which we must be prepared to train our clientele. Blind persons, like our sighted colleagues, must have a basic educational background which will permit their skills to be readily convertible in re-training programs. If it is true that the sighted worker of the future will require re-training at least six times during his work period, it will be even more imperative for the blind person in the competitive labor market.

The communications industry is merely one example of the way in which our plans must be directed. There are examples for all categories of work ranging from the professional to the unskilled.

In developing a counseling program for those clients who will be coming to us for services in the future, the counselor must be prepared to provide the type of assistance that will not merely consider occupational information of a current nature, but he must have the knowledge and skill to assist the client in planning for the type of jobs which will be available for many years to come.

With the impact of automation and the accelerated innovations on an expanding technological way of life, individuals engaged in vocational rehabilitation of disabled persons must not only maintain a current knowledge of work, but must be a number of years ahead in planning the preparation of those we serve in such a manner that they will have equal access to economic as well as social opportunities.

### Automation In The Future

At the present time, the computer is receiving primary consideration as the tool of automation. In the past decade, the number of computers in the United States has grown from 500 to 15,000, with a monetary investment developing from \$20 million to a present capitalization of \$6 billion. One of the interesting phenomena in this increase in computers is the fact that at least two-thirds of the growth has taken place in the past three years. This emphasizes the accelerated nature of this phase of automation.

The vocational rehabilitation programming is planning for occupational opportunities in this area with a project at the University of Cincinnati developing methods and techniques for training blind persons as programmers. With developments in other areas of the country for particular training programs, we should begin to gather the types of information which will permit us to plan for future needs in this type of work.

The computer is only one of the many families of automated tools that will change our world of work as we know it today. There will be drastic changes in industry, occasionally the numerically controlled machine tools and tape controlled equipment.

During the next few decades, these innovations in manufacturing processes will, of course, change our whole concept of industrial production. Instead of developing a large inventory of parts of consumer items, tapes will be stored which can be readily shipped to a particular area of the country as the parts are in demand and can then be reproduced on similar automated machines in the immediate locality of the need. This means, in essence, that instead of shipping parts or products, factories can be shipped.

### Seek New Methods For Control

Another example of what we can expect in the future from mechanization or automation as a part of the over-all approach of cybernetics is in the process-controlled industries.



At the present time, oil refineries, paper plants, power companies, etc. appear highly automated with rooms literally filled with instruments and gauges. These require the operators to watch many hundreds of variable factors in order to maintain an optimum control of the product continuously being produced.

This is now in the throws of a radical and drastic change in that systems are being developed and are far beyond the drawing board stage wherein a comprehensive and complete control of all variables can be maintained on an instantaneous basis. This is not necessarily a labor-saving proposition, but is primarily aimed at improving the efficiency of producing a stable product.

In the next quarter of a century, an even greater change can be expected with regard to information. The technical libraries we know today will be outmoded within a very short period with the development of information retrieval systems. This is already being noted in the fields of medicine and law, and, of course, will come to the general information centers as systems are developed for the retrieval of all types of subject matter.

### Must Keep Ahead Of Labor Demands

The concept that machines or systems can be developed wherein an individual can merely give an idea and a careful survey of subject titles can produce instantaneously specific references to implement this thinking, is not out of the realm of possibility. In fact, the matter of these systems is already possible as far as our knowledge of the necessary technical innovation is concerned.

The implications which the ever-growing rapidity in technological changes might have on the employment of blind persons are difficult to forecast. However, if we are to keep abreast of the competitive labor market with the selection, the training and the placement of our clients, we must keep at the very least, five years ahead of the current labor demands. Counseling cannot be casual in planning with our clientele. General training and specific training must be careful, calculated, serious matters.

Short-term vocational training for the unskilled or semi-skilled types of jobs can no longer be considered adequate preparation for those individuals aimed at the competitive labor market. It is true it does not require the same type of intensive training for the automatic dishwashing machine operator as it does for an individual entering a profession; nevertheless, these people who are blind must have the general training which will permit them to have the flexibility for specific training and especially for the basic educational background wherein their skills can be converted to meet the changing technological advances in the particular industries involved.

### Most Exciting, Challenging Segment

On June 30, 1966, I completed 20 years of experience in the field of vocational rehabilitation of the blind and the placement process continues to be the most exciting and challenging segment of my work. The outlook for the next 20 years is even more exciting, if we meet it with imagination, ingenuity and initiative. Our goal is building an environment in which every blind person who can work, and wants to work, will have equity in employer consideration.

The primary charge of both State and Federal Vocational Rehabilitation Legislation is to assist the disabled individual in the achievement of a vocational objective commensurate with his interest, abilities, and opportunity. A program of selective placement for blind persons will continue to play a key role in the rehabilitation process for generations to come.

We must always be aware of the necessity continually to improve methods and techniques of both training and placement. We must maintain a constant search for new occupations, new opportunities, and be willing to mold our program to fit employer needs which in the end go hand in hand with those of the clients we serve.



# INFLUENCE OF THE RANDOLPH-SHEPPARD ACT ON THE EMPLOYMENT OF BLIND PERSONS

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(Mr. Clunk was invited to prepare this article because of his participation in the placement of blind persons beginning in 1919, and because much of the development was due directly to the results he was privileged to achieve)

During the years between 1921 and 1940 it seemed to me that I was the only person at the AAWB conventions vigorously promoting industrial placement of the blind. I therefore undertake to present the facts in this article, impersonally and objectively.

## Employment prior to 1928

Most of today's rehabilitation personnel are of the opinion that employment of blind persons in industry and other occupations began with the second World War in 1941. There also is the impression that the last twenty-five years of specialized rehabilitation services have been sufficient to thoroughly educate the buyers of skills to accept blind labor on the same basis as though the individual were sighted.

In order to understand the influence of the Randolph-Sheppard Act of 1936 on the employment of blind persons and their general problem, it is necessary to briefly review prior developments and results.

A considerable number of blind persons were engaged in professions, clerical occupations, rural activities and in production industry for many years before 1936. Aggressive capable individuals without physical sight developed their own careers without the aid of governmental or professional placement officers.

Office recording equipment opened a few doors of opportunity for typists, and a number of capable blind persons were outstanding in the field of law, osteopathy, chiropractic, salesmanship, teaching and politics. A number of blind persons supported their families and community by continuing in their rural careers, but these persons were not conspicuous, and the lack of advertising of their achievements produced the impression that blind persons could not function in a rural environment.

## Special Pioneers in the Field

During the first World War, 1914-1918, blind persons in production industry assembled many kinds of small items and achieved a considerable reputation for accuracy in the inspection field.

Many industrial placements of these types were made by such pioneers as Mrs. Eva B. Palmer, Cleveland Society for the Blind, 1914-1920; Miss Mary Hulburt in Milwaukee, Wisconsin, 1915-1925; William Dresden, Detroit League for the Handicapped, 1915-1927; Francis Ierardi and Miss Florence Birchard, Massachusetts Division for the Blind 1915-1925.

The employment secured by these pioneers was almost entirely in the field of assembly of such items as nuts and bolts, wire rope clamps, stove burner parts, packing of toys, cosmetics, assembly of paper box parts, etc. Occasional placements were made in such industries as metal fabrication, shoes, candy and biscuits. Most of the industrial placements up to 1925 were in Chicago, Cleveland, Milwaukee, Minneapolis and Detroit.

In 1920 the Cleveland Society for the Blind made the first placements of blind persons as machine operators in metal fabricating businesses, and they were placed as operators of drill presses, milling machines, punch presses and related equipment. It fell to me as a young newly-blinded man to develop the method of analyzing industrial jobs by working on each process for an hour or more in the same manner as though employed by the company. This procedure enabled the employer to understand that various machines did not require sight on the part of an operator, and that persons without sight but possessing adequate basic ability could be employed as easily as sighted machine operators.

#### Lesson Learned in 1921 Depression

In the same year, 1920, I placed totally blind persons as machine operators in threading pipe couplings in the steel mills of Youngstown, Ohio and as employees in other metal fabricating plants of the area. In 1925 while training a local blind staff member of the Pittsburgh Association for the Blind, I placed people in a dozen principal industries in Pittsburgh.

In spite of this activity, industrial employment of blind persons continued to be restricted to a few cities in which a local administrator had special interest in the subject. The loss of jobs during the depression of 1921 convinced most workers for the blind that blind labor could only be used in a national crisis or in rare periods of top level prosperity. Thus, competitive employment was looked upon as an ideal that could only be realized when the nation was in an economic boom or crisis.

Also, regardless of the industrial placements made in the midwest between 1914-1925, industrialists and government administrators were not convinced as to the abilities of blind persons. In addition, blind persons did not believe that sighted employers would treat them fairly and would pay them the same wages as paid to the sighted.

#### Working In Broom Shops, Weaving Rugs

During this period, blind persons and their sighted friends were convinced that the sheltered workshop or the casual home industry program provided the principal answer for employment and wages to blind persons. Certain trades became traditional, and regardless of training and occupation prior to blindness, society, through the agencies, sentenced the newly-blinded adult to these "Blind Trades".



Blinded lawyers, doctors and business executives found themselves working in broom shops or weaving rugs or caning chairs along with blind persons, who had formerly been factory workers, construction laborers, or with persons who had no occupation prior to blindness. Basketry also was a favorite trade in which the blind person could be employed. These jobs were acceptable because they involved a large amount of handwork without the use of power equipment, and they were looked upon as safe and ideal for this reason.

A few individuals were trained in the operation of domestic sewing machines in their homes where they made simple designed aprons and hemmed a few towels, but even here, blind women were encouraged to do hand hemming instead of machine work because it occupied them more and restricted their production. Hand weaving of rag rugs was a favorite source of employment because it kept the blind person busy and was low in production. The caning of chairs is a slow and laborious process, and this, too, became an ideal trade for a few blind persons who possessed adequate skill.

It was also in this period that the public and the agencies serving the blind developed the philosophy that a blind person should be employed only in a trade or occupation where all processes or functions could be performed without sight and that it was unethical and in fact "unlawful" for sighted persons to work with a blind group, or for a workshop to make any article that required sighted labor for any of the processes.

#### Comparative Earnings 'Out of Order'

It is difficult to understand the reasons for the establishment of this philosophy for blind persons, that is so far removed from the principles involved in the employment of sighted persons, either handicapped or unhandicapped. None of the sighted groups are restricted to the production of articles in which every process is performed by a handicapped sighted worker. However, agencies for the blind established the principle that all the processes in the manufacturing of an article and every activity involved in a profession should be performed by the blind person and sighted coworkers should not be included.

A blind person making articles at home was required to be a designer, manufacturer and a purchasing agent for his own materials, a salesman for the finished product and a capitalist to finance materials and equipment. Such qualifications are not required from any other group of either normal or handicapped persons. Because of this point of view, the variety of employment in the sheltered shops, and the earnings of blind persons were restricted. Many agency directors were also convinced that blind workers had no right to receive more than \$10 per week, and, of course, earnings equal to those of the sighted in the same occupation were completely out of order.

The administrators of the Rehabilitation Act of 1920 did not change any of these concepts or improve employment for the average blind person. The philosophy of the agency was expressed by one state director who said, "Blindness is considered to be a total disability by all insurance companies and compensation boards, and I do not see how we can do anything for a person who is totally disabled."

For these reasons, blind persons were declared to be generally non feasible for rehabilitation services, and only an occasional person was accepted for college training or for work in a sheltered shop.

## Effect of Depression from 1929-1939

During the period, 1929-1939, the advocates of public assistance in all forms promoted Federal and State legislation that would give direct financial help to blind persons, on the premise that they could not be employed. The dependency of blind persons was exploited by these promoters, and the capabilities of the employable blind individual were subordinated and buried.

This ten-year period contained more despair and hopelessness for capable blind persons than any other decade in the Twentieth Century because no one could foretell the end of the depression, and everyone hoped that it would not require another World War to end it. Because blind persons could not secure normal employment, some effort was made to soften their problem in the activities related to the operation of small business.

Thus, in 1932, President Franklin D. Roosevelt issued an executive order which permitted blind persons to sell newspapers and periodicals from profitable newsstands in Federal buildings. This was a recognition of a problem but not an answer. About this time various bills were presented to Congress seeking permission to operate refreshment stands in Federal buildings, but none of these were approved until the Randolph-Sheppard Act of 1936, and the administration of this act did not begin until 1937. The results of the administration of this act in the refreshment stands have been well described in other articles.

Both employers of labor and the social agencies of the United States had no difficulty in excusing the idleness of blind persons during this period when practically all business reduced the numbers of its personnel, reduced wages of those still employed, and expressed the opinion that blind persons should not expect to work when so many of their sighted friends were unemployed. The Government work projects of this period absorbed a small number of blind persons in Braille projects but not enough to make any real impression on the problem.

The business in sheltered workshops suffered along with other businesses and blind persons lost their jobs. In order to stabilize the employment in the sheltered shops, Peter J. Salmon, Executive Director of the Industrial Home for the Blind in Brooklyn, New York and Robert B. Irwin, Director of the American Foundation for the Blind in New York developed legislation that would permit Federal departments of government to buy brooms, mops and other articles made by the sheltered shops and to do so without competitive bidding at a fair market price.

The Wagner-O'Day Act was approved in 1939, and the President's Committee on the Purchase of Blind Made Products was created. The law requires a liaison nonprofit organization to direct the assignment of government-use purchase orders and to supervise the relationships between the sheltered workshops, the Committee, and the Federal departments. The results of this legislation and the operation of it through National Industries for the Blind is a major story in itself. In this discussion it is sufficient to state that employment for blind persons in the sheltered shops has been expanded and stabilized beyond the imagination of anyone in the depression period. The expanded variety of products in the sheltered shops is doing much to favorably influence the acceptance of blind workers in competitive industry at the present time and wages to



these workers are equal to those paid to sighted workers for the same production.

### Canadian Development and Influence — 1928-1937

The first organized placement activity on a planned and permanent basis began in Canada in 1928. Colonel E. A. Baker, Managing Director, Canadian National Institute for the Blind, Toronto, Canada, believed that capable blind persons could perform production processes in industry making peace time merchandise just as well as they could be employed in war time making parts for armament. Canada had been in a depression since the first World War, and Colonel Baker looked upon the development of a placement department in a depression as an opportunity to develop and validate sound, practical placement techniques, and the results supported his confidence in these principles.

During the period of 1918-1928 the Canadian National Institute for the Blind employed three sighted persons to develop a placement department, but they were unsuccessful. In 1928, Colonel Baker offered the opportunity to me to build this department and to use the same methods and principles that had been successful in Cleveland, Youngstown, Ohio and Pittsburgh, Penn. I accepted the challenge and began the campaign on May 1, 1928. The principal qualifications possessed by me for the assignment were a fair amount of manual dexterity, unlimited enthusiasm, a missionary spirit, but above all confidence in the ability and desire of blind persons to work.

By 1930 the placement department had more blind persons at work in production industry and in vending stands than were employed by all five sheltered workshops in the Dominion. The skills of blind persons in industry and in business were presented to the Canadian employer on the same basis as other salesmen promoted the use of efficient but little-known equipment to the buyer, and the Canadian National Institute assumed full and permanent responsibility for continuing good results to the employer in the same way as a manufacturer of machinery guarantees results to his customer.

### 700 Placed Between 1928-1937

Young, totally blind men were recruited and trained for staff work and assigned to each of the Provinces. With the exception of myself, none of these pioneers had more than a high school education, and they placed blind men and women in the production industries of Canada during the worst economic depression the country ever had experienced. They proved that Colonel Baker was correct in his original assumption.

The department placed 700 blind persons in the period between 1928-1937 and developed the confidence of Canadian industry to such a degree that by 1931 the Institute began to receive invitations to bring blind persons to the plants. Many industries also invited the agencies to take over old stands or install new refreshment stands in their plants because of the satisfactory results produced by the administration of these services, and by 1937 the Institute was the largest operator of industrial refreshment business in the Dominion. The placement department has continued to function along the same lines in the employment of blind persons in competitive industry and the management of industrial lunch services has become as traditional in Canada as "any of the blind trades."

In 1934, Leonard A. Robinson (totally blind) of Cleveland, Ohio, readily accepted the suggestion from Canada that industrial placement should be included in the legislation that he was then single handedly promoting to establish vending stands in Federal and other buildings in the United States. The Congressional sponsors of the legislation, Senator Morris Sheppard of Texas and Congressman Jennings Randolph of West Virginia, readily agreed. The proof of the possibilities of industrial employment and successful vending stand operation was supplied by employer testimonial letters and photographs of a wide variety of placement made in Canada.

Finally Federal administrators and legislators were persuaded that equally good results should be possible in the United States, and accordingly, the Randolph-Sheppard Act gave its blessing to all types of employment for blind persons in addition to the operation of vending stands.\*

There is every reason to believe that the Randolph-Sheppard Act would never have been approved without the evidence and proof of practicality supplied by the Canadian development. Equal employment results in any other country would not have been accepted as completely because of differences with the United States in social and economic conditions. However, Canadian life is so nearly an exact duplicate of conditions in the United States that acceptance was almost compulsory. Many of the Canadian industries employers are subsidiaries of United States corporations with identical manufacturing and business conditions.

#### Beginning of Industrial and other Placement

When the Act was approved in June, 1936, there was no one actively working in the United States with any experience in the field of industrial placement or successful concession operation by blind persons. The Randolph-Sheppard Act was the first legislation enacted by Congress specifically aimed at the development of employment for blind persons. Of course, other legislation aimed at the employment of handicapped persons had been enacted, but the blind always were classified as non-feasible and unemployable and, therefore, the services to them were excluded by the administrators of such general legislation.

The Randolph-Sheppard Act was assigned to the Rehabilitation Service by the Commissioner of Education but the staff was not employed to administer the Act until June, 1937. Because the Act required that 50 percent of the personnel must be blind persons, I was invited to return to the United States from Canada and to administer the Act.

Thus, I became the first blind person to be employed under Civil Service by the Federal Government, and probably the first under any Civil Service in the United States. Within six months a blind dictaphone typist was employed under Civil Service, and within a year the Department had persuaded the

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\*(PUBLIC - NO. 732 - 74th CONGRESS)  
(H.R. 4688)

SEC. 2. (a) . . . . .

- (2) Make surveys throughout the United States of industries with a view of obtaining information that will assist blind persons to obtain employment;
- (3) Make available to the public, and especially to persons and organizations engaged in work for the blind, information obtained as a result of such surveys.



Federal Civil Service Commission to permit blind persons to qualify and receive appointments as attorneys in several Federal Departments.

By 1939, blind persons were accepted under Civil Service as inspectors and in other types of industrial employment in the munition depots in the armed services. By 1942, the Civil Service Commission of the Federal Government opened the doors of Federal employment to qualified blind persons in any department where the administrators would accept such employees.

#### Lacked Trained Placement Officers

In 1939, the Federal Service persuaded the New Hampshire Division for the Blind to establish the first farm training school for blind persons, and this was followed about 1946 by the second farm training center, operated in Ohio, by the Cincinnati Association for the Blind.

The development of industrial placement under the Act was not started until 1939 because of the complete absence of experienced or trained placement officers. None of the public or private agencies for the blind or rehabilitation agencies employed any one specifically assigned to the industrial placement of blind persons, and the administrator of the Act waited for a suitable candidate who could be trained and assigned to a local area.

O. E. Day, (totally blind) a mechanical engineer in Elwood, Indiana, requested help in his own rehabilitation problems. Because of his experience prior to blindness, and his personality, arrangements were made for him to receive six months of peripatetic field training with the placement department of Canadian National Institute for the Blind, under the leadership for Lindsay G. Williamson. He began this training in the spring of 1940.

The Overbrook School for the Blind in Philadelphia requested the Federal Service for the Blind to recruit and train someone who could place the graduates of the school. The superintendent employed Mr. Day at the conclusion of his training in Canada, and the first trained placement officer in the United States assumed his duties in Philadelphia in September, 1940.

The Federal Service continued the training of O. E. Day by assisting him in making the first industrial placements in Philadelphia. Thus began a procedure which resulted in the training, employment and assignment of placement officers in various parts of the country. Arthur Voorhees and Carl Hvarre in New Jersey, James Hyka in Cleveland, John McGettigan in Pittsburgh, August McCullom in Kansas, Kenneth McCullom in Connecticut, Floyd Lacy in Texas, Carston Ohnstead in Oklahoma, Carlos Gattis in Arkansas, John McCauley in Seattle, Huben Walker in Tennessee, Walker Moran in Maine, J. Hiram Chappel in Oregon and Anthony Septinelli of California. Most of these totally blind men received their practical field training in Canada. In 1942, John McAulay (totally blind) of Seattle, Washington, joined the Federal staff. By agreement with the local agencies, he conducted intensive placement campaigns of thirty days each in Louisiana, Colorado and Delaware, and demonstrated to these areas and to the country that industrial placement of blind persons was not restricted to any one area.

The activities of these unofficially trained placement agents resulted in the employment of several hundred blind persons in the war industries of the nation by 1943.

## Influence on New Legislation

In 1942, the National Society for the Blind in Washington, D. C., requested the agencies for the Blind to provide information on the employment of blind persons in each of the states in any occupation other than sheltered workshops and vending stands. Approximately 8,000 persons were reported as employed and some states reported complete absence of employed blind persons.

These self-developed occupations included a large variety of types of jobs and professions and provided conclusive evidence to the effect that blindness itself did not prohibit the participation of aggressive individuals in any occupation for which they had basic talent and ability. Federal administrators and members of Congress were amazed at the evidence of the wide activities of blind persons, achieved through their own resources, and as a result the Federal Security Administrator approved special services for blind persons in the developing of the 1943 Bardon-LaFollette Amendments to the Rehabilitation Act of 1920.

As the Randolph-Sheppard Act was the first legislation aimed at the development of employment for blind persons, the Bardon-LaFollette Act of 1943 was the first to authorize grants of Federal funds to the states specifically for the rehabilitation of blind persons, and it was the first Federal recognition of the responsibilities of State agencies for the blind in the employment field.

## First Federal Dollar to North Carolina

As nearly as a survey could determine in 1942, all the states combined reported less than \$25,000 assigned to all rehabilitation case services for the blind for that year, and this included the states in which the pioneering placement officers were functioning. The first Federal dollar assigned to a state specifically for the rehabilitation of blind persons was given to the State of North Carolina in December, 1943. The State agencies for the blind soon recognized the need for State appropriation to match Federal grants, and the present day march toward personal achievements for thousands of blind persons began at that time.

Because of the recognition of the problem in the Bardon-LaFollette Amendments, and the availability of funds, the first group training classes for totally blind placement officers were developed in the spring of 1944, and nine trainees were admitted in each of these classes of six weeks' duration. Three were conducted in Baltimore, Md.; two in Chicago, Ill.; one in Atlanta, Ga.; and two in Washington, D. C. during 1944 and 1945. On each occasion, twenty different types of industry in each community cooperated by permitting the trainees to work in their plants on standardized production processes selected by the Federal staff.

Thus, in four weeks of the training period each trainee had actual work experience on approximately one hundred different processes in twenty kinds of typical production plants, most of which are found in every state. These plants included electrical appliances, electric motors, machine shops, bakeries, laundry and dry cleaning, wood fabrications, clothing, food processing, department stores, plastic production, sheet metal printing and paper processing, textile production, plumbing materials, batteries, radio and television, farm machinery and furniture. In addition to this factory experience in job



demonstration, the trainees received intensive training in analysis of legislation, public speaking, employer interviewing and showmanship. The first training courses for groups of business enterprises, specialists and rural occupation specialists were conducted during this period.

J. Hiram Chappell (totally blind) a member of the Federal staff, conducted the rural training courses and the continuous field service required to assist these rural specialists in their assignments in the several states. Thus, the problems of blind persons in rural areas received attention and services for the first time.

### Comparative Results

In 1936 the general rehabilitation agencies for the sighted of the country reported two blind persons as being rehabilitated. In 1950 all the agencies reported more than 3,400 blind persons as being rehabilitated. Last year, 5,450 blind persons were reported as rehabilitated. The agencies for the blind appropriated more than \$6,500,000 in 1965, and the Federal Services assigned more than \$11,000,000 to the states for the same purpose. It required three years to find a suitable candidate to begin industrial placement in 1940. This was the only local placement agent in the entire country, and last year, 736 individuals were employed as professional rehabilitation personnel in 37 state agencies for the blind. Of these, 314 of these have placement responsibilities.

The first adjustment training center for handicapped persons was one for the blind in Daytona Beach, Florida, in 1947, and this has been followed by similar adjustment training centers on a state-wide or regional basis in all parts of the United States and in many foreign countries.

Even though Federal and State Governments now assign approximately \$20,000,000 a year for the rehabilitation of blind persons and more than 1,000 professional staff people are employed for public and private agencies for the blind, the employer public in 1966 still possesses an emotional resistance to the acceptance of physically blind persons as employees that is not much less than the resistance possessed and expressed by employers before the enactment of the Randolph-Sheppard Act. Intensive sales methods and public relations activity are required to keep the old doors of employment open and to find new ones.

### World Influence

The World Conference on the Welfare of the Blind at Oxford, England, in 1949, gave very little attention to competitive employment of blind persons in production industries, and the entire matter was looked upon as a dream for the future. The Paris meeting of the World Council of 1954 gave considerable time to this subject because the results achieved in the United States and Canada had become known to the participating countries, and a few of them had started similar developments. The Rome conference, 1959, gave practically all of the time of the convention to the employment of blind persons in every kind of occupation, and delegates from the participating countries boasted about their results, and they were justifiably proud of them. The same conference in New York in 1964 was unqualified in its acceptance of the abilities of blind persons to participate as staff members in the agencies and in the local industries and occupations of all the nations of the world. These world wide results owe their existence to the results in the United States and Canada.

If the Randolph-Sheppard Act had never been approved it is quite probable that all placement services for the blind would not have been developed on a planned aggressive basis in the United States, and no one knows when it might have started. Without the results produced by the pioneering placement agents, there would have been no evidence to support and encourage special attention for the blind in the Bardon-LaFollette Amendments of 1943. Although an executive order of the President in 1932 had granted permission to blind persons to sell newspapers and periodicals in Federal buildings, the unsatisfactory operation of these unsupervised news stands had practically closed the doors of Federal buildings to this activity by 1936.

### Owe Much to Randolph-Sheppard Act

The article in "Blindness 1965" described the results in vending stands under the Randolph-Sheppard Act and requires no elaboration here. Without the Randolph-Sheppard Act the various pioneering placement agents would not have been employed because no one in the United States would have coaxed the agencies into such action. It is unlikely that the Federal Government would have accepted blind persons and permitted them to qualify for Federal employment for many years although they might have been included in some of the programs which now give attention to the mentally retarded and to all other types of physical impairment.

Without the demonstrated results in the United States, it is quite probable that the other countries would still have closed doors to the promotion of employment of blind persons who are providing the spark of inspiration for rehabilitation administrators and staff workers all over the world. An employed native of Central Africa, factory workers in South America and India, a blind farmer in Central Europe who has been trained in a European farm school, blind rehabilitation staff members in all the countries, hundreds of dictaphone typists in government departments of the United States, thousands of college students and blind persons in professions—all of these at the present time owe a debt of appreciation to the Randolph-Sheppard Act, its promoter, its sponsors and administrators.

The administration of this legislation has proven that the welfare of blind persons in one country affects the welfare of blind persons in all other countries, and that blindness doesn't exist in solitary confinement in a water-tight compartment.



# PROSTHESIS FOR THE BLIND-- ONE BILLION DOLLARS IN TEN YEARS?\*

*By Dr. George G. Mallinson, Dean, School of Graduate Studies  
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October 4, 1957, the date on which the Russians launched Sputnik I, may be viewed in many different perspectives. It was a day of humiliation, real or imaginary, when "those people" suddenly orbited the first satellite, thus placing the United States in an allegedly unenviable position of being second. It was a day on which much witch-hunting began. Instead of crediting the Russians with much scientific and technological skill, we sought to find the perpetrators of the indigence and delay that resulted in our failure to orbit some hardware earlier. American education, declining juvenile morality, and the degradation of Appalachia were among the phenomena castigated. It may be viewed, also, as the real beginning of the Space Age when man first began to send and control vehicles outside the earth's atmosphere. Many dour scientists, including colleagues of the writer, proclaimed that the United States would need at least 25 years of intensive research before a satellite equivalent to Sputnik I could be orbited. Without question, the day set off the "Space Race" with one major objective the landing of a manned vehicle on the moon presumably with the subsequent return of the occupants. This noble venture is referred to as Project Apollo.

There is little doubt that a manned vehicle on the moon will elicit vast amounts of scientific information, much of great importance, and much also of questionable importance. The exact cost of Project Apollo will probably never be known, although it is estimated that direct and indirect expenditures aimed at landing and hopefully returning the vehicle and its occupants will be at least 50 billion dollars.

What may be expected on the lunar surface? The best thinking indicates that the vehicle will have a somewhat uncertain landing on a surface of dubious characteristics. It is generally agreed, however, that the surface will be hotter than boiling water during the day and colder than dry ice during the night, both of these periods lasting about 14 days. There is little doubt that the environment will be airless, waterless, and, except possibly for some organic compounds similar to those in living things, lifeless. The elements necessary to provide an environment capable of life support will need to accompany the vehicle and occupants, thus limiting the tenure of the spacemen on the lunar surface.

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\* Note: The nature of this publication has suggested that technical and scientific details be kept to a minimum. The references cited will provide many pertinent details, assuming the reader is desirous of exploring them further.

Because the moon is a smaller sphere than the earth, its curvature is such that the horizon is approximately one mile distant, thus limiting visual communication to about one mile. Direct auditory communication will be impossible since there is no air to carry sound waves. Whether the legendary Indian ear-to-ground technique for listening for hoofbeats may be adapted for communication is a matter of conjecture, but probably unlikely. Since radio waves travel in straight lines and there is no Kennelly-Heaviside layer in the atmosphere to reflect waves back to the lunar surface, ordinary radio communication beyond the distance of a mile will not be feasible. Thus, 50 billion dollars is indeed a handsome sum to place spacemen in such an unfriendly environment with such restricted orientation and mobility. Nevertheless, it is being expended with little complaint.

Some persons believe that October 4, 1957, may best be viewed as a day of irony. Less than 10 years after the ignominious collapse of Vanguard I, science and technology, marshalled in a vast crash effort, have produced feats of "orbitalmanship" for the United States not even imagined at that earlier date. More than one hundred different space vehicles have been placed in orbit. Spacemen have cavorted at the end of synthetic umbilical cords outside space vehicles to the delight of television viewers and their compatriots inside.

Yet with at least 90 million Americans having some kind of eye trouble, in 3.5 million of whom the trouble is serious, and with more than 300 thousand persons totally blind, less than 10 million dollars per year are being spent in the attempt to find causes, preventives and control for diseases that destroy sight. Probably considerably less is spent for research designed to provide some type of replacement for that loss of sight. The greatest irony is that there are at least 50,000 times as many persons with relatively inadequate means for mobility living in a modestly satisfactory environment, as there will be spacemen struggling to survive in a hostile environment. A comparison of the fiscal support given the two programs is ample evidence of cultural blindness.

This cultural blindness is evident in the problems related to real blindness, particularly concerning the development of prosthetic devices for blindness as compared with those for other sensory handicaps. Research on prosthetic devices to aid the auditory handicapped has been directed toward helping the deaf to hear better, and from this research, the modern hearing aid has emerged. Likewise, research on devices to aid the orthopedically handicapped has been directed toward helping the individual walk about better or to grasp objects more effectively, to wit, the development of artificial limbs. However, with blindness, most of the effort has been directed toward helping the individual feel his way about better.

It is noteworthy that a special Gallop poll conducted for Research to Prevent Blindness, Inc. revealed that next to cancer, the affliction most feared by American people is blindness.

Yet, in spite of the inexorable conclusions that must be drawn, a scientific attack on the problems of blindness using the total available resources of science and technology is yet to be marshalled. The approaches being taken and the activities underway epitomize the philosophy of "little think."

Despite these anomalies, October 4, 1957, may be viewed with optimism from several aspects. The crash effort in science and technology for competing



in the Space Age has produced many significant developments that indicate cautious optimism for "substitute sight." It should be noted here that the writer uses the term "substitute sight," not substitute for sight. Specifically it is hypothesized that the artificial eye with accompanying sight may be less "blue sky" than may have been previously surmised by rational persons. Such possibilities are based on changing "little think" to "Big Think." This suggests the application of the imagination and scientific knowhow used in photographing Mars on the problem dealt with here. In brief, the dissipation of cultural blindness could lead to the alleviation of real blindness, at least to some degree.

### Glimmers of Insight

Obviously, postulates for systems of substitute sight are not inventions of this writer. Many individuals have had ideas antecedent to those expressed here. But, within the past few years, speculations on such possibilities have been based on some optimistic developments in the fields of electronics, space technology and neurophysiology.

One such investigator, Shaw, (1) patented a device employing photoelectric circuits which generate and send signals to the brain of a blind person producing the sensation of light. Another investigator, the neurologist Button, (2) has conducted experiments that enable blind persons to see light. This is accomplished by stimulating certain brain cells with voltages generated by photocells and conducted through wires to the brain. The reports suggest that the investigator planned additional experiments involving many wires to be connected permanently to the brain carrying visual currents produced by miniaturized electronic devices. The investigator predicted that in the "not too distant future" visual impressions obtained by the blind will approximate true vision with an apparatus as simple as the hearing aid.

It seems to the writer that the efforts of Shaw and the conclusions of Button were quite premature and possibly unrealistic on the basis of knowledge then current in the relevant fields of neurophysiology and the relatively macro-level of electronics technology when these statements were first made. This is directed particularly at Button's, (3) optimism and some of his later reports about implantation as an appropriate technique. The writers' views about such optimism are supported by Shipley, (4) who states that "the intimate neurodelicacies of sensory mechanisms seem honor bound to resist our mechanical intrusions." Cautious but more optimistic positions have been taken by Shrager and Susskind, (5) in their review in which the two following statements appeared:

"... recent progress in neurophysiology makes it at least conceivable that artificial stimulation of the brain itself to provide a visual sensation might be achieved some day. Here, as in the case of devices[for guidance and reading], success will depend on the close cooperation of workers in psychology, engineering and physiology. This collaboration has been increasing in recent years, and interdisciplinary groups are growing rapidly." Page 262.

They further indicate:

"It should be stated at the outset that artificially stimulating "vision" in a blind person is not likely to become a reality in the immediate future."

A number of psycho-physiological problems, some directly, and some indirectly, related to stimulation of the brain to produce vision are discussed in the Annual Review of Psychology by Onley. (6) Obviously, these problems are not part of an organized presentation related to the possibilities of substitute sight, but they do imply some of the investigations that need to be undertaken next, if substitute sight is to be developed.

### Problems Formidable, Perhaps Insuperable

The writer was apprised recently of some "off-the-record statements" made by extremely competent individuals who have been concerned with the application of science and technology to problems of artificial sight. Because of their "off-the-record" nature, the comments will be only paraphrased here.

One of the less optimistic individuals indicated that the consensus of his neurophysiological colleagues is that the neuroanatomical problems on connecting any conceivable "artificial eye" hardware in the visual nervous system are formidable, if not insuperable. Estimates of the time required to achieve the minimal useful knowledge for such purposes are thought to range from five to fifty years. His colleagues believe it will be harder to make the appropriate "connections" than to produce the necessary inputs.

Another scientist indicated that the knowledge of peripheral (primary sensory neuron) auditory physiology is nearing the level of sophistication necessary for developing artificial end organs. The major problems that do remain and which are claimed to be purely technical, included among others mode of connection, tissue tolerance without degeneration and numbers of channels needed. He indicated there was some question as to whether blind persons could learn to use effectively an input which, under the best of conditions, would not be identical to those from the "original model" even if the model was not technically superior to the substitute.

Still another scientist indicated there is no serious unsolved methodological difficulty at the apparatus and hardware end of the man-made interface but that the major unsolved problem lies entirely within the domain of physiology. A similar comment from another engineer indicates that the engineering knowledge is much farther ahead than the physiological knowledge. However, he believes that we should immediately get to work on the application of the latest engineering techniques to develop visual replacements while waiting for the physiologists to learn more about the operation of the human brain.

One scientist indicates that research has been conducted for several years in his laboratory on the conditioning of animals to electrical stimulation introduced directly into various brain regions. In addition to the theoretical interest of these studies with respect to information processing methods of the brain, they are concerned with the practical possibilities for sensory prosthetic devices. In his judgment there is already physical evidence that information can be directly introduced into the brain, but currently there is inadequate evidence to evaluate the information handling capacity of such as input channel. However, he believes that such stimulation, under specific conditions, could replace some of the qualities of normal sensation, but he hesitates to speculate how good this reproduction might be.



One of the more optimistic indicates that he is convinced, from a technical point of view, that the creation of an "artificial eye" is sufficiently feasible at this time to warrant serious research efforts for its development. The image pickup, signal conditioning and filtering aspects of the problem are well within the current state of the engineering art. He believes that the application of micro-electronics and solar power supplies to current technology could result in a substitute eye that would produce a signal similar to that which enters the optic nerve.

From these comments plus the information provided in many other sources, one may evidence cautious optimism about the likelihood of developing an artificial eye. Optimistic statements have been made by some scientists, although the pessimistic comments of others cannot be disregarded. Yet the expressed pessimism has emerged in the light of minimal level funding with little or no organized systems analysis of the types of information needed and the research that should be undertaken.

Thus there is reason to believe that an organized major effort, adequately funded, involving both systems analysis and systems engineering, might result in the development of artificial sight within the lifetimes of many who are now blind. It is, of course, impossible to compare the magnitude of such an effort with that of the present space program. Such a comparison cannot be made until a sustained effort analogous to that of the space program has been undertaken.

#### Prospects for Hardware and Technology

Obviously, any group of devices which together provide artificial sight must meet certain practical limitations. Among these are portability, comfort and economy. Fortunately, electronic circuitry that contains a full complement of transistors, resistors, capacitors and other essential components and, yet occupies less space than a pinhead, is now regularly produced on the assembly lines of electronic manufacturers. In a recent article by Hittinger and Sparks(7) this information appeared:

"Between 1955 and 1965 the electronics industry developed and reduced to practice a remarkable microelectronic technology that has shrunk transistors and other circuit elements to dimensions almost invisible to the human eye. A complete circuit consisting of 10 to 20 transistors and 40 to 60 resistors can be built into a bit of silicon measuring only about a twentieth of an inch on a side. Between 100 and 500 such 'integrated' circuits can be manufactured simultaneously on a silicon wafer that is about an inch in diameter and less than a hundredth of an inch thick. . . With the new microelectronic technology it is hardly more costly to put 100 circuit elements on a single chip of silicon than it is to put one, 10 or 50. Moreover, the 100 elements can then be handled as a unit when the final system is being assembled. Whereas a good transistor cost about \$1 as an individual unit in 1960, an integrated circuit containing several dozen transistors and other elements can now be bought for about the same price."

Thus, the routine requirements of portability and economy, and in all likelihood comfort, have been met.

In a system for substitute sight three major components must be included:

1. A scanning "device" that will convert light into electric current.
2. An "organizing device" that may temporarily store the electrical energy and serve as a transducer to produce electrical impulses.
3. A mechanism that will use the pulses from the transducer for stimulating the "visual areas" of the brain.

The first component can be accomplished by applying routine technologies and hardware already developed by NASA. Obviously, devices capable of scanning the Martian surface from several thousand miles and producing adequate signals for a later transmission to the earth over a distance of many million miles are readily adaptable for such a component. The Technology Utilization Program of NASA is available as a resource.(8)

### Formidable Neuro-physiological Difficulty

Specifications for the hardware for the second component are still a matter of some conjecture. However, technologies are nearly refined for producing information storage devices with capacities for staggering amounts of information and which seem to have the capabilities desired. Among these devices are the ferrite memories such as the IBM Flute for which fabrication methods are in final stages of development.(9) It has been estimated that in some of these systems it will be possible to store 250 billion digits of information in a volume of seven cubic inches with microsecond retrieval. The adaptability of such ferrite memories in a transducer component seems eminently practical.

The problem with the third component is, of course, one of the more formidable as has been indicated in many references already cited. The problem, essentially neuro-physiological rather than technical, involves the connection of artificial organs to body parts. Some efforts in which attempts have been made to implant materials in the brain have been far from successful. Thus, this approach does not seem currently to be the most practical solution.

Some research efforts about which there is little publicity involve the stimulation of the nervous system by means of electromagnetic induction. The application of such principles might eliminate the need for implantation and connecting artificial and regular body parts. However, in order to apply such a principle for stimulating vision, much needs to be learned about the mechanisms by which visual imagery is produced in the brain. There is no reason, however, to assume that such information is illusive and its acquisition insuperable. Neither is there evidence that its acquisition will require vastly different avenues of neurophysiological research than are now being employed.

### Need for Great Caution

Before making any recommendations for proceeding with "Project Big Think" in a major research effort to develop substitute sight, the writer wants to emphasize the need for the greatest amount of caution. Under no circumstances should any statements in this article be used as support for diminishing efforts in improving current techniques of orientation and mobility, whether such efforts involve dogs, the long cane, or ultrasonics.

If the efforts in developing some system of substitute sight are successful, it is likely that the pioneer devices will be crude and at best will serve only a



few of the blind population. It is also reasonable to expect that the entire blind population may not be served, even if more sophisticated systems emerge.

It is likely also that medical services necessary for compromising the device-man interface will be relatively sparse, and that for some time only a few of the blind who are anticipating prosthesis can be accommodated. Thus, efforts in improving and disseminating present techniques for orientation and mobility, however mundane they may seem, also must be accelerated.

### \$100 Million Per Year Is Trivial

Obviously, several steps are needed if efforts for marshaling talent and technology are to be successful. One of the most important involves appropriate publicity, which will lead to adequate funding.

The funding must obviously be at the Federal level and should constitute a commitment of at least \$1 billion over ten years. A commitment of \$100 million per year, however, is trivial. When one considers the U.S. population of nearly two hundred million persons, any one of whom has a chance to be blind, a gamble of fifty cents per year per head for a system of "substitute sight" is "small potatoes" indeed. This point must be brought to the attention of those at the "decision-making" level both from a mundane pecuniary viewpoint, as well as from one of social conscience. This matter, however, can be debated later.

Most important, the very best brains in the fields relevant to such a system must be recruited without regard for cost. Their talents must be directed toward the various unsolved aspects of the problem, which are identified by a thorough systems analysis and attacked through systems engineering.

### Need For Someone to Light Fuse

Unfortunately, many admirable proposals traverse the systems analysis stage and falter at systems engineering. Thus the various associations concerned with blindness, including the American Association of Workers for the Blind, the American Foundation for the Blind, and the American Association of Instructors for the Blind, and all the agencies in the Federal government concerned with blindness might well marshal their forces toward such a goal, since the stakes are far higher than those in any of their previous activities.

The talent and much of the technology are available. Perhaps one may well consider the words of "Boss" Kettering, who commented shortly after Sputnik I, "We have all the talent and technology we need in the United States to complete successfully in the space race or in any other race. All we need is someone to light the fuse."

Why doesn't the AAWB light the fuse?

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# RESEARCH IN SENSORY AIDS FOR THE BLIND, STATE-OF-THE-ART, 1966

*By Howard Freiburger*

It would hardly be possible for me to consider in any detail the many fine researches being pursued throughout the world in sensory aids for the blind. Even a brief cataloging of the work in the United States sponsored by the Government forms an extensive document appearing elsewhere in this issue of BLINDNESS. By mentioning some of the work I shall try to convey an impression as to what one would most likely find if he were to ferret out each individual worker and each separate project.

The reader who needs greater detail and who wishes to do some independent study of source materials will find the Catalog Appendix (1) as well as the first three volumes of the same set quite useful. The reprint edition of Paul A. Zahl's BLINDNESS (2) with an updated bibliography current to 1962 should also lead a reader to much information. A classified annotated bibliography on 3 x 5 inch file cards, kept current by supplements, is the work of Miss Isabella S. Diamond of the AAWB staff with sponsorship of VRA. Distributed to certain reference centers throughout the country, and available for individual purchase, this system also contains a wealth of data. The Research Bulletin (3) of American Foundation for the Blind contains original and reprint articles very useful to the sensory aids researcher. Briefs on results of Veterans Administration sensory aids research are carried in the semi-annual Bulletin of Prosthetics Research (4).

The reader desiring to "dig deeper" should not overlook the vast amounts of information contained in the closely printed columns of United States and foreign patents. Four patents (10), (19), (22), (23), are included in this paper's references by way of example and to supplement the text. The proceedings of the invitational International Conference on Sensory Devices for the Blind held June 13-17, 1966 by St. Dunstan's, London, England, should provide additional up-to-the-minute facts.

## Two Broad Avenues to Solution Open

I should now like to indulge in some categorizing to introduce the reader to the many-faceted interdisciplinary activities which currently engage the sensory-aids researcher. As with any other problems facing mankind there are open to us two broad avenues to solution of the problems of blindness—a direct approach with relatively frontal attack, and an indirect approach using tactics of circumvention. By the direct approach I refer to the most elegant, though difficult to achieve solution, some form of true "artificial vision," wherein a straight-forward attempt would be made to replace with a functioning man-made prosthesis those parts of the visual system whose dysfunction

causes the blindness. At best such a system would restore vision essentially to normal. More realistic goals at first may be restoration of only some coarser form of vision or light perception, but relying on a light receiving "end organ" capable of transmitting sensed optical information to appropriate central nervous system points. These ideas have intrigued men for a long time, but to date only rudimentary experiments have been made, and in your author's view both the biological and engineering problems posed by this approach are most formidable. In another paper in this issue of "BLINDNESS" Prof. George G. Mallinson considers this direct approach in greater detail.

By the indirect approach I refer to the efforts to provide some substitute for a non-functioning visual system but by means which circumvent the awesome difficulties of directly feeding visual information to the visual centers of the brain. Such means generally make use of remaining sensory systems, hearing and touch for a blind person, and touch alone for one who is deaf-blind.

The Rev. Thomas J. Carroll in the book "BLINDNESS" (5) analyzes the losses resulting from blindness in considerable depth. In addition to psychological, aesthetic, vocational, financial and personality factors, he holds losses in basic skills such as mobility, and losses in communication capabilities such as reading to be important. It is to counter these latter two losses that much recent technological sensory aids research has been undertaken. Mobility devices, travel aids, obstacle detectors, path-finders, optar, midar, ensor, amauroskop, elektroftalm are but a few of the terms used in naming mobility aids. Similarly with reading machines one hears terms such as optophone, visotoner, visagraph, colineator, visotactor, recognition machine, optotact, etc.

Mobility devices may be broadly classified into active and passive types. The active systems emit some form of energy which interacts with the environment and, upon selective reflection therefrom, carries back information about the surroundings to the instrument's receiver. Passive systems do not "illuminate" the environment with emitted energy, but are responsive to existing ambient conditions. Both systems have their engineering advantages and disadvantages and at this time it is not at all clear that one is outstandingly superior to the other.

Another parameter, long familiar to radar, optical, and sonar engineers, relates to the type of coverage of the environment the system provides. Some systems have narrow beams with which to examine the environment. They must usually be scanned over the surroundings to obtain adequate quantities of information. Systems with wide beams require less scanning, but if active, may require more energy, and may yield less detailed information. It must be emphasized that the amount of energy needed by a system is a limiting factor in practical design because the energy source usually must be carried by the user and should allow for an operating endurance of at least a normal day's use.

Vision is a sense which makes use of the electromagnetic energy known as light, and because light travels so nicely through so many media, vision provides information about things at a distance from the observer. One will find that most mobility systems proposed also rely on some physical phenomenon capable of action-at-a-distance. Instruments have been proposed and often built which employ visible light, infrared or ultraviolet light, radio waves, sound, and the electrostatic field to get their capability to probe into space around



them. Much information in these areas may be found in (1) and in the Proceedings of the Rotterdam Mobility Research Conference (6).

The work at Bionic Instruments, Inc., Bala-Cynwyd, Pennsylvania, sponsored by the Veterans Administration, is an example of current-day efforts to produce a multi-beam, narrow-beam width, injection laser light, mobility aid for the blind, housed in a specially designed cane (4), (7). Experience over the years has led designers of such instruments to the conclusion that the advantages over an ordinary long cane are in the areas of early warning, protection in the head and shoulders region, and more information about the environment which usually connotes better orientation capabilities for a blind person. This electronic-optical cane "looks" upward to the region about six feet ahead of the user and at head level to provide warning of overhanging or protruding objects. It "looks" ahead for early warning of objects in the path (or absence thereof indicating a clear path). The third beam scans the terrain, the aim here being to give ample warning of discontinuities such as drop-offs or rises. The cane shaft can simultaneously be used in a more or less conventional way to provide information by direct contact with the environment.

#### Inventor Inspired By Blind Bats

An example of a modern mobility aid using sound energy to probe the environment is the ultrasonic aid for the blind marketed for experimental trials by Ultra Electronics, Limited, London, England (8), (9), (10). One successful trial user of this device, Fred Gissoni, has already published some comments (11). This 10 oz. hand-held, flashlight-like aid directs pulses of inaudible swept-frequency ultrasonic energy to the environment being probed. Reflected ultrasound is converted in the receiver section of the unit to an audible signal which through an earpiece gives the user information as to the range and texture of objects scanned. The amazing performances of certain blind bats (12), (13) known to use pulsed ultrasonic energy in their "guidance system," no doubt inspired the inventor of this ultrasonic aid.

Before I leave the subject of mobility aids, I should like to point out that there are three more-or-less distinct levels to the mobility problem, and that consideration of the man-aid-environment system is essential to productive results in the travel aid area. Closest to a blind person is his very immediate environment, and he must avoid (or find) items here as he moves from place to place. A wine glass on a table is perhaps an extreme example, but in taking even a few steps in a room, chairs, tables and cabinets often interfere with clear passage. A second level is one of orientation in the local space. Just where in a room am I, where are the door(s) and window(s); when I depart which way shall I go? A third level is akin to navigational position fixing. Where in the city, along a country lane, in a field, or on a transit system am I? While conventional mobility means and practices of blind people supply much information regarding the environment at all three levels mentioned above, we look to the future when a true mobility aid may begin to approach the level of helpfulness achievable today only with a sighted guide.

The problem of reading for the blind also has been attacked frontally by those who develop systems designed to actually "read" the printed characters on a page and convey their information to a blind person. "Back-door" approaches which avoid direct reliance on print include not only traditional specially prepared materials such as braille and recorded books, wherein a

sighted reader takes some part in the process, but also more recently developed experimental systems making use of the wealth of material perforated into Teletypesetter or Monotype tapes, readily machine readable (14), and reasonably suitable for non-human input to braille making (15) and possibly spoken word reproducing systems (16).

Systems involving various combinations of automated and human services, usually involving some central master facility connected to the blind person's home or location by the regular telephone lines have also been described (17). One variant would have a scanning attachment in the blind users location to receive printed or written matter, transmit it to the central location where it would be read back to the subscriber over the telephone by an impersonal operator. Such a system was demonstrated by David H. Shepard at the Sixth Reading Machine Conference.

### Hearing and Touch Generally Unimpaired

A sampling of much recent thought regarding reading machines for the blind may be found in the minutes of the conferences held from time to time since 1954 by the Veterans Administration, the sixth and most recent having been held at Washington, D.C., January 27-28, 1966 (17).

Because the senses of hearing and touch are generally unimpaired in a blind person, classes of reading machines have developed having audible or tactile outputs. Some blind people also are deaf, others, particularly as they age, have hearing losses, and some, possibly because of burns, chemical accident, or neurological lesion, have poor touch sensation in their finger tips. Sensory dysfunctions, impairing one or more of any of our principal information channels with the outsideworld, suggest why aids must be available with outputs matching the remaining capabilities of the individual.

Reading machines have been classified as being "direct translation" (18), (19), "intermediate" (20), or "character recognition" (21) types. The direct translation machines are usually the simplest to construct. They only translate directly the graphic letter-shape information on a page to some audible or tactile rendition, a process involving very little machine processing of information, storage, or logic functions.

The intermediate machine does somewhat more processing, and may recognize certain letter features as projections below the line as in "g", "j", "p", "q", and "y". It does not, however, identify each letter, a procedure accomplished in the recognition machine, the most complex device of all. Assuming optimum development of all of these classes of machines, and this happy state of affairs has by no means been reached, it is quite likely that the simplest physical construction, the direct translation type, will require the greatest user stress in operation, while the complex recognition machine will permit much more relaxed reading.

The work at Mauch Laboratories, Dayton, Ohio, on the "Visotoner" (21) is an example of current research efforts to produce a small, portable, optical-to-sound, direct translation reading machine for the blind. This unit is battery driven, accommodates to most conventional print sizes, and produces tone combinations from a bank of nine tone generators dependent on letter shapes being scanned. Reading speeds with such an instrument are



expected to be slow, some persons reading only five words per minute after some training, though exceptional readers with instruments of this general optophone class have reported speeds ten times as high for short passages of certain materials.

Mauch Laboratories is also working to improve their "Visotactor," a small direct translation device with tactile output. Work on a direct translation tactile device has also been reported by Linvill and Bliss (22). Their system, simulated in part through use of a computer, has resulted in some encouraging reading rates.

The intermediate reading machine seems to attract fewer researchers than either of the other types. Patrick W. Nye (17), (20), has reported some careful comparisons with other systems and analyses of this system, and as one would surmise, the results are somewhat better than those obtained with the simpler optophone, and are inferior to results predicted for recognition types.

A first experimental prototype of a complete recognition reading machine system for the blind was completed at Mauch Laboratories in 1965 (17), (21). This unit comprises an adjustable optical system which focuses an image of the print on the page onto a specially designed photocell array. As the letter image passes over the cells, up to five "snapshots" or interrogations of cell condition (dark or light) may be made. This information is decoded in a diode matrix designed to identify upper and lower case letters and certain printing ligatures. Once identified, the letter information is passed to the word synthesizer (23), a device which can group the individual letters into a word-group, and then utter in close succession the sounds of the word-group in Metfessel's spelled-speech (24). One thus hears what is on the page in a sort of coalescing spelling which Professor Metfessel feels can convey information at 60-90 words per minute after relatively brief training with the system. As of this writing the whole system has been demonstrated under laboratory conditions with carefully tracked typewritten materials at speeds of around 30 words per minute.

In conclusion, I should like to emphasize that the sensory aids for the blind which we have been discussing are, by definition, simultaneously aids for all human beings. Now human beings are often loath to use devices or engage in practices where the very act of so doing takes more out of them than they are able to derive in benefits or satisfactions. Similarly, most reject courses which mark them as too different from their fellow humans. It is my belief that these human traits have conspired against the introduction of so many of the sensory aids, carefully built, patented and promoted by hopeful inventors over the years gone by. Looking with confidence to the not-too-distant future, however, it is felt that increasing awareness by engineers and physical scientists of behavioristic concepts, and their every increasing technological capabilities allowing for man-made constructions rivalling nature herself in areas of size, weight, complexity and power requirements, will certainly lead to some exciting new sensory aids.

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# LIBRARY SERVICES FOR THE BLIND, 1966

(A supplement to the article which appeared in *Blindness*, 1965)

*By Robert S. Bray*

The past year brought the national program of providing reading materials to blind persons a step closer to maturity, with more than 100,000 persons using the books and periodicals provided by the Division for the Blind of the Library of Congress. No other public program for the blind serves that many individuals.

The most dramatic demonstration of the need for additional book resources has been the explosive growth in the use of magnetic tape as a reading medium, which was started some five years earlier. By July of 1965, more than 4,000 blind persons were using their own standard tape players to read specialized books of sophisticated or limited interest, as well as general material provided by the Library of Congress on standard, seven-inch reels of tape. By the end of the year, 12 of the 32 regional libraries for the blind had expanded their services to include the circulation of books recorded on magnetic tape.

## Indexing of Reference Works Needed

A study early in the year, conducted by the Library of Congress, of the use made of recorded periodicals indicated that, like the general public, blind persons read magazines extensively when they are available. The problems of recording discs at eight revolutions per minute were resolved to the point that it is possible to produce an entire issue of some magazines on a single record. When a sufficient number of talking-book machines which incorporate the 8 RPM speed are available for widespread distribution, it will mean that blind persons may be able to receive current recorded periodicals direct from the manufacturer of the records as soon as they are produced, and need not return them. While this type of service is taken for granted by readers of print magazines and is now enjoyed by blind persons who receive a few religious periodicals, it will be a major step forward for popular, national magazines in recorded form.

Increased use of recordings for serious reading and for studying have emphasized the need for adequate indexing of reference works. The technique of superimposing key words recorded at high speed on a slow-speed tape or disc recording was developed and tested with highly favorable results. The compression of recorded speech to increase reading rate without causing sound distortion was also investigated, and preliminary field tests were promising. Work on this project will continue with the aim of enabling blind persons to approximate the reading speeds of the general public. The average rate of speech, and thus of recorded books, is 170 words per minute, while the average rate of reading print silently is 300 words per minute.

A few years ago, under a grant from the Richard King Mellon Foundation, Recording for the Blind contracted with the Solocast Company for the develop-

ment of five prototypes of a Recording for the Blind portable disc player. Last May, Recording for the Blind received a grant from the U.S. Vocational Rehabilitation Administration for 200 "Pocket Book" machines to conduct a thorough testing in the field. This is now going on country-wide. Not only will these machines play embossed 7-inch discs satisfactorily, but they have variable speed motors and enable the reader to skip ahead or back to any portion of the record. They can also be played in any position, including slung over the shoulder while walking.

In the field of braille, technological experimentation fell primarily in the area of high-speed production using electronic computers to simultaneously translate print into the braille code and emboss it without the use of plates or presses. Proposed coordination of such a system with the electronically-produced punched tapes now common in the publishing world may enable braille editions of standard works to be produced quickly and economically.

The use of raised line drawings and diagrams to supplement recorded books was developed and used extensively by Recording for the Blind. The Library of Congress encouraged the use of the Virkotype process by having commissioned floor plans and maps of restricted geographical areas. These can be used by blind persons since they consist of raised surfaces and braille by the partially sighted because they include large print, and by the general public because of the strong contrasts in both print and lines.

#### Progress In Printing Large-Type Books

A manual on the braille format for textbooks was completed and published during 1965. It was the cooperative project of the Braille Authority, working with an advisory committee of educators and transcribers, and publication was made possible by a grant from the Vocational Rehabilitation Administration to the American Printing House for the Blind. The Nemeth Code of Braille Mathematics was also completed and is in process of being published. Work was started on a braille phonetics code, and was continued on the manual for music transcribers.

The year 1965 was notable for progress in the field of books printed in large type for use by visually-impaired persons who have sufficient residual sight to read such print. For the first time, publishers released several popular titles at prices comparable to regular trade editions. The books of adult interest issued in a convenient format by Keith Jennison were the first to receive wide distribution. The National Society for the Prevention of Blindness issued its Guidelines for the Production of Material in Large Type for the use of volunteers, and the American Library Association completed its study on the same subject for printed works. Their confirmation of the usefulness of standard typography, with minor changes in format, and photographic enlargement, will facilitate the large-scale production of printed materials in large type. A poll taken by the Division for the Blind of the Library of Congress revealed that almost half of the 4,000 blind persons who responded could read 18-point type with or without the aid of a magnifying glass. The implications of this fact may influence how public libraries can meet the reading needs of such people by acquiring sufficient books in the appropriate type size and format.



## Public Libraries Cooperating

Local public libraries are also showing a genuine interest in using their human resources to assist blind readers in every way possible. During the year more than 2,500 community libraries asked to be placed on the mailing list for the print editions of Talking Book Topics and Braille Book Review to be kept informed of the latest titles made available to blind residents of their areas. Those two periodicals continued to improve in both format and contents and represent the only publications sent to every blind person known to the Regional Libraries for the Blind. The braille edition is issued in more copies than any other braille publication in the world. To supplement the activities of 32 Regional Libraries and bring their resources closer to the individuals needing them, some 200 small "browsing collections" of braille and recorded books have been deposited with public libraries, schools, hospitals and other organizations in communities throughout the country.

Growth and recognition are gratifying. But there is still the sobering fact that only a fraction of eligible blind persons are using the reading resources available to them. To reach more of them, and to assure that service is adequate when it is offered, the Commission on Standards and Accreditation of Services for the Blind completed, by the end of the year, its Standards for Library Services for the Blind and Visually Handicapped. Already approved by the American Library Association, they will be published in 1966. By providing guidelines to libraries of every type and pointing up the responsibilities of all levels of government, these standards will help in making it possible for blind persons to receive library service which is really comparable to that which is now enjoyed by the general public.

The Round Table on Library Service to the Blind of the American Library Association decided in 1965 to present an annual award for distinguished service. Named in honor of Francis Joseph Campbell, a pioneer in making books available to blind persons, the citation and medal will be presented to an individual who has made an outstanding contribution in that specific field.

An indication of the maturity of a program is its willingness to cooperate with related activities to further mutual goals. Close liaison and cooperative projects were carried on during the year by the Division for the Blind and organizations such as Recording for the Blind, Science for the Blind, the National Braille Association, and others active in producing reading materials. In addition to the two professional associations which are directly related to service to blind persons, the American Association of Workers for the Blind and the American Association of Instructors of the Blind, 1965 saw active participation by such organizations as the American Optometric Association, the American Association of University Presses, Boy Scouts of America and the Association of American Geographers.

Another indication of maturity is the willingness to share resources with those in need who could not otherwise have access to them. While library service to blind persons has been growing steadily for the past three decades, similar service to persons who are visually impaired but not blind has lagged far behind. Equally inadequate have been any efforts to provide library service to individuals who cannot handle or manipulate books and magazines because of physical impairments.

As of this writing, there is still no sharing of available resources with these two groups. But concern for such needs is increasing. For the first time, there is active cooperation in the direction of making it possible to provide such handicapped persons with the recordings which are now available only to those who are blind. Bills have been introduced in Congress to achieve this goal. No action was taken on these Bills during 1965, but there are strong indications that such proposals will be favorably considered during 1966. There is no doubt that efforts expended in establishing and providing library service to blind persons eventually will prove highly beneficial to all those physically-handicapped people for whom reading is now a problem.

This has been an attempt to indicate some of the highlights in the field of library service to blind persons during 1965. A short list of articles and pamphlets published during the year constitute Appendix I.

## APPENDIX I

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# U.S. GOVERNMENT SPONSORED RESEARCH TO STUDY BLINDNESS - 1966 SUPPLEMENT

*By Mary E. Switzer and C. Warren Bledsoe*

## VOCATIONAL REHABILITATION ADMINISTRATION RESEARCH GRANT AND DEMONSTRATION PROJECTS

Listed by Grant Number, Grantee, Project Director and Purpose

| GRANT NO. | PROJECT IDENTIFICATION                                | GRANTEE AND PROJECT DIRECTOR                                                                                              | PURPOSE AND INTEREST CATEGORY*                                                                                                                                                                                                                          |
|-----------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1445      | Mobility and Orientation Instruction of Blind People. | Vocational Rehabilitation Division<br>State Capitol<br>Charleston, West Va.<br>Earl A. Wolfe                              | Mobility Project (II-D).                                                                                                                                                                                                                                |
| 1612      | A Test of Intellectual Potential of Blind People.     | Alabama Institute for Deaf and Blind<br>Talladega, Ala.<br>A. R. Bishop                                                   | A pilot study to explore the possibilities of tests based on other than educational and cultural achievement, pursuing the line of European tests which rely on ability to perceive differences in patterns of dots on the surface of dominoes. (II-E). |
| 1641      | Mobility and Orientation Instruction of Blind People. | Tennessee School for the Blind<br>115 Stewarts Ferry Road<br>Nashville, Tenn.<br>Eugene J. Wood.                          | Mobility Project (II-D).                                                                                                                                                                                                                                |
| 1692      | Mobility Training for Blind Clients.                  | Services for the Blind<br>Dept. of Social Welfare<br>Lewis Cass Building<br>Lansing, Mich.<br>Edward A. Fitting,<br>Ph.D. | Mobility Project (II-D).                                                                                                                                                                                                                                |

\* Code of Interest Category: I, Vocational; II-A, Prevocational-Centers; II-B, Prevocational Processes; II-C, Prevocational-Processes-Optical Aids; II-D, Prevocational Processes-Mobility Demonstrations; II-E, Prevocational-Processes-Testing; III, Equipment; IV, Personnel.

VOCATIONAL REHABILITATION ADMINISTRATION RESEARCH  
GRANTS AND DEMONSTRATION PROJECTS (Continued)

| GRANT NO. | PROJECT IDENTIFICATION                                                                                   | GRANTEE AND PROJECT DIRECTOR                                                                                                                     | PURPOSE AND INTEREST CATEGORY*                                    |
|-----------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1693      | Mobility and Orientation Instruction of Blind People.                                                    | New Hampshire Association for the Blind<br>60 School Street<br>Concord, N. H.<br>Edward W. Mathews                                               | Mobility Project (II-D).                                          |
| 1770      | Orientation and Mobility Training in a Sighted Rehabilitation Center and the State School for the Blind. | Special Services for the Blind<br>Vocational Rehabilitation Agency<br>Box 8117 University Station<br>Grand Forks, N. Dak.<br>Rodney Kossick      | Mobility Project (II-D).                                          |
| 1784      | Mobility Instruction for Blind Youth Utilizing Parents, Teachers and Mobility Specialists.               | Department of Special Education, California State College at Los Angeles<br>5151 State College Drive<br>Los Angeles, Calif.<br>F. E. Lord, Ph.D. | Mobility Project (II-D).                                          |
| 1787      | Demonstration Grant for Low Vision Clinic.                                                               | State University of New York at Buffalo<br>462 Grider Street<br>Buffalo, N. Y.<br>W. Yerby Jones                                                 | Optical Aids Project (II-C).                                      |
| 1826      | Vocational Adjustment to Failing Vision.                                                                 | American Center for Research in Blindness and Rehabilitation<br>770 Centre Street<br>Newton, Mass.<br>Christine Kris, Ph.D.                      | To study the value of objective predictors in retinopathy (II-E). |

\* Code of Interest Category: I, Vocational; II-A, Prevocational-Centers; II-B, Prevocational Processes; II-C, Prevocational-Processes-Optical Aids; II-D, Prevocational Processes-Mobility Demonstrations; II-E, Prevocational-Processes-Testing; III, Equipment; IV, Personnel.



VOCATIONAL REHABILITATION ADMINISTRATION RESEARCH  
GRANTS AND DEMONSTRATION PROJECTS (Continued)

| GRANT NO. | PROJECT IDENTIFICATION                                                                                                                                                                    | GRANTEE AND PROJECT DIRECTOR                                                                                                                    | PURPOSE AND INTEREST CATEGORY*                                                                                                                                                                                                                                                                               |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1836      | Development of Standards for Specialized Agencies Serving Blind Persons.                                                                                                                  | American Foundation for the Blind<br>15 West 16th Street<br>New York, N. Y.<br>Alexander F. Handel                                              | To help raise the performance level of specialized agencies and institutions serving blind persons through identification and codification of standards applicable to their service and to recommend methods for the implementation of these standards. (IV).                                                |
| 1843      | Demonstration of the Effect of Mobility Training in Preparing Blind High School Students and Other Blind Applicants for Rehabilitation Services in Prince George and Montgomery Counties. | Division of Vocational Rehabilitation,<br>State Department of Education<br>2100 Guilford Avenue<br>Baltimore, Md.<br>George W. Keller           | Mobility Project (II-D).                                                                                                                                                                                                                                                                                     |
| 1898      | Salaries for Selected Occupations in Services for the Blind, January 1966.                                                                                                                | American Foundation for the Blind<br>15 West 16th Street<br>New York, N. Y.<br>Harold G. Roberts                                                | To collect current data about salaries and education of selected key professional and administrative personnel employed by organizations specializing in serving blind persons which can be compared with similar data collected in 1961 and 1955 (See BLINDNESS 1964 Annual, AAWB, Project 1, p. 15). (IV). |
| 1901      | Placing the Blind and Visually Handicapped in Industrial, Clerical and Service Occupations.                                                                                               | Office for the Blind<br>Department of Public Welfare<br>Health and Welfare Building, Room 102<br>Harrisburg, Penn.<br>Norman M. Yoder,<br>Ph.D. | To develop in the fields of clerical, industrial and service occupations, information about jobs done by blind people; how these jobs are managed without vision, the nature, amount and sources of training for the jobs, and the characteristics required for success. (I).                                |

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VOCATIONAL REHABILITATION ADMINISTRATION RESEARCH  
GRANTS AND DEMONSTRATION PROJECTS (Continued)

| GRANT NO. | PROJECT IDENTIFICATION                                                                                                                                           | GRANTEE AND PROJECT DIRECTOR                                                                                                       | PURPOSE AND INTEREST CATEGORY*                                                                                                                                                                                                                                                                                                                        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1906      | Psychosocial Factors in the Vocational Rehabilitation of the Blind.                                                                                              | Social Science Research Center<br>University of Puerto Rico<br>Rio Piedras, P. R.<br>Carlos Albizu-Miranda, Ph.D.                  | To make a census of the blind population of Puerto Rico. To make a detailed study of a random sample of adult blind persons. (I).                                                                                                                                                                                                                     |
| 1908      | Testing a Portable Disc Player Especially for Use by Blind Students.                                                                                             | Recording for the Blind, Inc.<br>215 East 58th Street<br>New York, N. Y.<br>Jasha Levi                                             | To purchase 200 models of a portable, battery-operated disc player especially designed for use by the blind, and to determine through field testing the efficiency, durability and general value of this machine as an instrument in the education of blind students. (III).                                                                          |
| 1951      | A Study of the Educational Psychological, and Psychometric Factors Pertinent to the Selection, Training and Vocational Adjustment of Blind Computer Programmers. | Computer Sciences Laboratory<br>University of Southern California<br>University Park<br>Los Angeles, Calif.<br>William T. Mitchell | To determine the skills, traits, intellectual competence required for training totally blind persons to program computers and the precise vocational activities best suited for blind programmers. (I).                                                                                                                                               |
| 1956      | Demonstration of the Significant Achievements in in the Vocational Adjustment of Blind Persons Through the Provision of Specialized Services.                    | Minneapolis Society for the Blind<br>1936 Lyndale Ave., S.<br>Minneapolis, Minn.<br>Byron M. Smith                                 | A 3-year demonstration project 1) to show how the use of rehabilitation techniques for the blind—home teaching, mobility, therapy, and casework will result in better, more economical placement of blind persons, 2) to demonstrate how to teach and prepare them to work and live independently within normal community living arrangements, and 3) |

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VOCATIONAL REHABILITATION ADMINISTRATION RESEARCH  
GRANTS AND DEMONSTRATION PROJECTS (Continued)

| GRANT NO. | PROJECT IDENTIFICATION                                                   | GRANTEE AND PROJECT DIRECTOR                                                                                                                         | PURPOSE AND INTEREST CATEGORY*                                                                                                                                                                                                                                                                                                                                                                |
|-----------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1956      | (Continued)                                                              | Byron M. Smith<br>(Continued)                                                                                                                        | to orient community workers and directors of community living facilities to the special needs of the blind so that the blind will be accepted and rehabilitated to their fullest extent. (II-A).                                                                                                                                                                                              |
| 1969      | Early Rehabilitation Services for the Newly Blinded.                     | The Jewish Guild for the Blind<br>1880 Broadway<br>New York, N. Y.<br>Anne McGuire                                                                   | A pilot study grant to locate newly blinded individuals to determine reasons why those blind persons in need of rehabilitation services fail to utilize available services, to investigate needs not being currently met by agency programs, and to chart direction for future programs. (I).                                                                                                 |
| 1974      | Prototype - Low Vision Aid Clinic.                                       | Department of Ophthalmology,<br>State University of New York Upstate Medical Center<br>766 Irving Avenue<br>Syracuse, N. Y.<br>James L. McGraw, M.D. | Optical Aids Clinic. (II-C).                                                                                                                                                                                                                                                                                                                                                                  |
| 2012      | Regional Saturation of Services to the Blind in Metropolitan Pittsburgh. | Metropolitan Pittsburgh Agencies for the Blind<br>201 North Bellefield<br>Pittsburgh, Pa.<br>Donald D. Dauwalder                                     | A pilot study to inventory and analyze services currently offered the blind and visually impaired by existing public and voluntary and private agencies in the 4-county area consisting of the Pittsburgh Standard Metropolitan Statistical Area (as defined by the U.S. Dept. of Labor), thereby assisting the agencies and consultants associated with the Metropolitan Pittsburgh Agencies |

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VOCATIONAL REHABILITATION ADMINISTRATION RESEARCH  
GRANTS AND DEMONSTRATION PROJECTS (Continued)

| GRANT NO. | PROJECT IDENTIFICATION                                                                                                                               | GRANTEE AND PROJECT DIRECTOR                                                                                                              | PURPOSE AND INTEREST CATEGORY*                                                                                                                                                                                                                             |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2012      | (Continued)                                                                                                                                          | Donald D. Dauwalder<br>(Continued)                                                                                                        | for the Blind, Inc. in determining the exact needs for strengthening existing services and methods for accomplishing this. (I).                                                                                                                            |
| 2030      | Construction and Evaluation of an Individual Diagnostic Test of Braille Perceptive Ability.                                                          | Boston University<br>755 Commonwealth Avenue<br>Boston 15, Mass.<br>Leo F. Hanley, Ph.D.                                                  | To construct and evaluate a diagnostic instrument to isolate and categorize types of misperceptions of Grade II Braille Symbols. (II-E).                                                                                                                   |
| 2064      | Preliminary Studies of Feasibility of Electro-cortical Prostheses.                                                                                   | Albert Einstein College of Medicine<br>Yeshiva University<br>H. G. Vaughan, Jr., M.D.<br>and<br>Herbert Schimmel, Ph.D.<br>(Bronx, N. Y.) | A pilot study to determine the feasibility of an optical-electronic system which might provide visual perception to the blind through the delivery of electrical stimuli to the visual cortex. (III).                                                      |
| RC-22     | Development of Teaching Methodology for Language Teachers of Sighted Students and the Training of Blind Persons to be Foreign Language Teachers.     | Institute of Languages and Linguistics<br>Georgetown University<br>Washington, D. C.<br>R. Ross MacDonald, Ph.D.                          | To provide a program of specialized instruction for blind persons in foreign language and in language teaching methodology in order to investigate methods of enabling the blind to be effective teachers of foreign language to sighted students. (II-B). |
| RC-35     | A Contract to Facilitate the Flow of Advanced Technology Being Proposed by the Space and Defense Programs into Vocational Rehabilitation Activities. | Bio-Dynamics, Inc.<br>207 Bent Street<br>Cambridge, Mass.<br>Robert E. O'Brien                                                            | A contract to speed and promote the application of technological advances coming from space research and practice to rehabilitation needs. The first year's efforts will be concerned with sensory aids and devices for the Blind. (III).                  |

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# VOCATIONAL REHABILITATION ADMINISTRATION GRANT FUNDS

## FISCAL YEARS 1965-1966

### New Grants

| Project No. | Grantee                                                                                                     | Beginning Year | Grant 1965 | Awards 1966 |
|-------------|-------------------------------------------------------------------------------------------------------------|----------------|------------|-------------|
| 1445        | Vocational Rehabilitation Division<br>Charleston, West Virginia . . . . .                                   | 1966           | \$         | \$ 10,496   |
| 1612        | Alabama Institute for the Deaf and<br>Blind, Talladega, Alabama . . . . .                                   | 1965           | 1,611      |             |
| 1641        | Tennessee School for the Blind<br>Nashville, Tennessee . . . . .                                            | 1965           | 9,100      |             |
| 1692        | Services for the Blind, Department of<br>Social Welfare, Lansing, Michigan                                  | 1965           | 6,466      |             |
| 1693        | New Hampshire Association for the<br>Blind, Concord, New Hampshire                                          | 1966           |            | 35,048      |
| 1770        | Special Services for the Blind,<br>Vocational Rehabilitation Agency,<br>Grand Forks, North Dakota . . . . . | 1966           |            | 15,819      |
| 1784        | Department of Special Education, State<br>College at Los Angeles, California                                | 1966           |            | 66,124      |
| 1787        | State University of New York<br>Buffalo, New York . . . . .                                                 | 1966           |            | 5,530       |
| 1826        | American Center for Research in<br>Blindness and Rehabilitation<br>Newton, Massachusetts . . . . .          | 1965           | 15,000     |             |
| 1836        | American Foundation for the Blind<br>New York, New York . . . . .                                           | 1965           | 61,680     |             |
| 1843        | Division of Vocational Rehabilitation<br>Baltimore, Maryland . . . . .                                      | 1966           |            | 11,200      |
| 1898        | American Foundation for the Blind<br>New York, New York . . . . .                                           | 1966           |            | 16,000      |
| 1901        | Office for the Blind, Department of<br>Public Welfare<br>Harrisburg, Pennsylvania . . . . .                 | 1966           |            | 35,000      |
| 1906        | Social Science Research Center,<br>University of Puerto Rico,<br>Rio Piedras, Puerto Rico . . . . .         | 1966           |            | 61,070      |

# VOCATIONAL REHABILITATION ADMINISTRATION GRANT FUNDS

FISCAL YEARS 1965-1966 (Continued)

## New Grants

| Project<br>No. | Grantee                                                                                                  | Beginning<br>Year | Grant<br>1965 | Awards<br>1966 |
|----------------|----------------------------------------------------------------------------------------------------------|-------------------|---------------|----------------|
| 1908           | Recording for the Blind, Inc.<br>New York, New York . . . . .                                            | 1966              |               | 29,250         |
| 1951           | Computer Sciences Laboratory,<br>University of Southern California,<br>Los Angeles, California . . . . . | 1966              |               | 10,000         |
| 1956           | Minneapolis Society for the Blind<br>Minneapolis, Minnesota . . . . .                                    | 1966              |               | 40,190         |
| 1969           | The Jewish Guild for the Blind<br>New York, New York . . . . .                                           | 1965              | 15,000        |                |
| 1974           | Department of Ophthalmology,<br>State University of New York,<br>Syracuse, New York . . . . .            | 1966              |               | 6,374          |
| 2012           | Metropolitan Pittsburgh Agencies for<br>the Blind, Pittsburgh, Pennsylvania                              | 1966              |               | 14,800         |
| 2030           | Boston University<br>Boston, Massachusetts . . . . .                                                     | 1966              |               | 31,846         |
| 2064           | Albert Einstein College of Medicine<br>Bronx, New York . . . . .                                         | 1966              |               | 15,000         |
| RC-22          | Institute of Languages and Linguistics<br>Georgetown University,<br>Washington, D. C. . . . .            | 1965              | 70,159        |                |
| RC-35          | Bio-Dynamics, Inc.<br>Cambridge, Massachusetts . . . . .                                                 | 1966              |               | 61,464         |
|                | Total . . . . .                                                                                          |                   | \$179,016     | \$465,211      |



# VOCATIONAL REHABILITATION ADMINISTRATION GRANT FUNDS

FISCAL YEARS 1965-1966 (Continued)

## Continuation Grants

| Project<br>No. | Grantee                                                                                      | Beginning<br>Year | Grant<br>1965 | Awards<br>1966 |
|----------------|----------------------------------------------------------------------------------------------|-------------------|---------------|----------------|
| 1004           | Industrial Home for the Blind<br>Brooklyn, New York . . . . .                                | 1962              | \$            | \$ 84,990      |
| 1082           | Catholic Charities<br>Chicago, Illinois . . . . .                                            | 1963              |               | 14,770         |
| 1107           | Stanford Research Institute<br>Menlo Park, California . . . . .                              | 1963              | 22,922        |                |
| 1167           | University of Wisconsin<br>Madison, Wisconsin . . . . .                                      | 1963              | 38,765        |                |
| 1168           | Alameda County School Department<br>Alameda, California . . . . .                            | 1963              |               | 21,798         |
| 1169           | Mecklenberg County Association for<br>the Blind,<br>Charlotte, North Carolina . . . . .      | 1963              | 9,000         |                |
| 1179           | Society of St. Vincent de Paul<br>St. Louis, Missouri . . . . .                              | 1963              | 27,661        |                |
| 1232           | Arkansas Enterprises for the Blind<br>Little Rock, Arkansas . . . . .                        | 1963              | 17,498        |                |
| 1241           | Eye Research Foundation of Bethesda<br>Bethesda, Maryland . . . . .                          | 1964              |               | 8,400          |
| 1296           | Cleveland Society for the Blind<br>Cleveland, Ohio . . . . .                                 | 1965              |               | 48,400         |
| 1306           | Services to the Blind, Division of<br>Welfare, Concord, New Hampshire                        | 1965              |               | 3,390          |
| 1325           | Minneapolis Society for the Blind<br>Minneapolis, Minnesota . . . . .                        | 1964              |               | 6,975          |
| 1327           | Hawaii State Center for the Blind and<br>Visually Handicapped,<br>Honolulu, Hawaii . . . . . | 1964              | 15,328        |                |
| 1328           | Arkansas Enterprises for the Blind<br>Little Rock, Arkansas . . . . .                        | 1964              |               | 8,122          |

# VOCATIONAL REHABILITATION ADMINISTRATION GRANT FUNDS

FISCAL YEARS 1965-1966

## Continuation Grants

| Project<br>No. | Grantee                                                                      | Beginning<br>Year | Grant<br>1965 | Awards<br>1966 |
|----------------|------------------------------------------------------------------------------|-------------------|---------------|----------------|
| 1336           | North Dakota School of Science<br>Wahpeton, North Dakota . . . . .           | 1964              | \$            | \$ 42,412      |
| 1343           | Cincinnati Association for the Blind<br>Cincinnati, Ohio . . . . .           | 1965              |               | 8,100          |
| 1344           | Marquette University School of<br>Medicine, Milwaukee, Wisconsin             | 1964              |               | 11,983         |
| 1382           | Eye Research Foundation of Bethesda<br>Bethesda, Maryland . . . . .          | 1964              |               | 37,000         |
| 1407           | American Foundation for the Blind<br>New York, New York . . . . .            | 1964              | 55,066        |                |
| 1415           | D. C. Department of Vocational<br>Rehabilitation, Washington, D. C.          | 1964              | 21,000        |                |
| 1480           | Rehabilitation Institute<br>Detroit, Michigan . . . . .                      | 1964              | 39,214        |                |
| 1485           | University of Cincinnati, College of<br>Medicine, Cincinnati, Ohio . . . . . | 1965              |               | 54,400         |
| 1487           | Catholic Guild for All the Blind<br>Newton, Massachusetts . . . . .          | 1964              | 27,535        |                |
| 1531           | Minneapolis Society for the Blind<br>Minneapolis, Minnesota . . . . .        | 1964              | 500           |                |
| 1538           | Evansville Association for the Blind<br>Evansville, Indiana . . . . .        | 1965              |               | 10,900         |
| 1539           | Rhode Island Association for the Blind<br>Providence, Rhode Island . . . . . | 1965              |               | 8,817          |
| 1541           | Houston-Harris County Lighthouse for<br>the Blind, Houston, Texas . . . . .  | 1965              |               | 9,426          |
| 1542           | Cincinnati Association for the Blind<br>Cincinnati, Ohio . . . . .           | 1965              |               | 8,070          |
| 1571           | Recording for the Blind, Inc.<br>New York, New York . . . . .                | 1965              | \$            | \$ 18,500      |



# VOCATIONAL REHABILITATION ADMINISTRATION GRANT FUNDS

FISCAL YEARS 1965-1966 (Continued)

## Continuation Grants

| Project<br>No. | Grantee                                                                                             | Beginning<br>Year | Grant<br>1965 | Awards<br>1966 |
|----------------|-----------------------------------------------------------------------------------------------------|-------------------|---------------|----------------|
| 1578           | State University of New York<br>Albany, New York . . . . .                                          | 1964              | 19,858        |                |
| 1616           | Division of Vocational Rehabilitation<br>Atlanta, Georgia . . . . .                                 | 1965              |               | 8,718          |
| 1625           | Stanford University, School of<br>Medicine, Palo Alto, California..                                 | 1965              |               | 37,000         |
| 1690           | Cleveland Society for the Blind<br>Cleveland, Ohio . . . . .                                        | 1965              |               | 8,798          |
| 1826           | American Center for Research in<br>Blindness and Rehabilitation,<br>Newton, Massachusetts . . . . . | 1965              |               | 6,341          |
| RC-8           | Massachusetts Institute of Technology<br>Cambridge, Massachusetts . . . . .                         | 1965              |               | 86,154         |
| RC-18          | Massachusetts Institute of Technology<br>Cambridge, Massachusetts . . . . .                         | 1965              |               | 99,967         |
|                | Totals . . . . .                                                                                    |                   | \$294,347     | \$653,431      |

GRANTEE AGENCIES OF VOCATIONAL REHABILITATION  
ADMINISTRATION GRANTS CONCERNING BLINDNESS

Listed Alphabetically

| Grantee                                                                                               | Project No. |
|-------------------------------------------------------------------------------------------------------|-------------|
| Alabama Institute for Deaf and Blind<br>Talladega, Alabama . . . . .                                  | 1612        |
| Albert Einstein College of Medicine, Yeshiva University<br>Bronx, New York . . . . .                  | 2064        |
| American Center for Research in Blindness and Rehabilitation<br>Newton, Massachusetts . . . . .       | 1826        |
| American Foundation for the Blind<br>New York, New York . . . . .                                     | 1836 1898   |
| Bio-Dynamics<br>Cambridge, Massachusetts . . . . .                                                    | RC-35       |
| Boston University<br>Boston, Massachusetts . . . . .                                                  | 2030        |
| Computer Sciences Laboratory, University of Southern<br>California, Los Angeles, California . . . . . | 1951        |
| Department of Ophthalmology, State University<br>Syracuse, New York . . . . .                         | 1974        |
| Department of Special Education, California State Colleges<br>Los Angeles, California . . . . .       | 1784        |
| Division of Vocational Rehabilitation<br>Baltimore, Maryland . . . . .                                | 1843        |
| Georgetown University (Languages and Linguistics)<br>Washington, D. C. . . . .                        | RC-22       |
| Metropolitan Pittsburgh Agencies for the Blind<br>Pittsburgh, Pennsylvania . . . . .                  | 2012        |
| New Hampshire Association for the Blind<br>Concord, New Hampshire . . . . .                           | 1693        |
| Office for the Blind, Department of Social Welfare<br>Harrisburg, Pennsylvania . . . . .              | 1901        |
| Recording for the Blind, Inc.<br>New York, New York . . . . .                                         | 1908        |



GRANTEE AGENCIES OF VOCATIONAL REHABILITATION  
ADMINISTRATION GRANTS CONCERNING BLINDNESS

Listed Alphabetically

| Grantee                                                                                                 | Project No. |
|---------------------------------------------------------------------------------------------------------|-------------|
| Services for the Blind, Department of Social Welfare<br>Lansing, Michigan . . . . .                     | 1692        |
| Social Science Research Center, University of Puerto Rico<br>Rio Piedras, Puerto Rico . . . . .         | 1906        |
| Special Services for the Blind, Vocational Rehabilitation Agency<br>Grand Forks, North Dakota . . . . . | 1770        |
| State University of New York at Buffalo<br>Buffalo, New York . . . . .                                  | 1787        |
| Tennessee School for the Blind<br>Nashville, Tennessee . . . . .                                        | 1641        |
| The Jewish Guild for the Blind<br>New York, New York . . . . .                                          | 1969        |
| Vocational Rehabilitation Division<br>Charleston, West Virginia . . . . .                               | 1445        |

PROJECT DIRECTORS OF VOCATIONAL REHABILITATION  
ADMINISTRATION GRANTS CONCERNING BLINDNESS  
Alphabetically Listed

| Project Director                       | Project Number |
|----------------------------------------|----------------|
| Albizu-Miranda, Carlos, Ph.D. . . . .  | 1906           |
| Bishop, A. R. . . . .                  | 1912           |
| Dauwalder, Donald D. . . . .           | 2012           |
| Dostert, Leon, Ph.D. . . . .           | RC-23          |
| Fitting, Edward A., Ph.D. . . . .      | 1692           |
| Handel, Alexander . . . . .            | 1836           |
| Hanley, Leo F., Ph.D. . . . .          | 2030           |
| Jones, W. Yerby. . . . .               | 1787           |
| Keller, George W. . . . .              | 1843           |
| Kossick, Rodney. . . . .               | 1770           |
| Kris, Christine, Ph.D. . . . .         | 1826           |
| Levi, Jasha. . . . .                   | 1908           |
| Lord, F. E., Ph.D. . . . .             | 1784           |
| MacDonald, R. Ross, Ph.D. . . . .      | RC-22          |
| Mathews, Edward W. . . . .             | 1693           |
| McGraw, James L., M.D. . . . .         | 1974           |
| McGuire, M. Anne . . . . .             | 1969           |
| Mitchell, William T. . . . .           | 1951           |
| O'Brien, Robert E. . . . .             | RC-35          |
| Roberts, Harold G. . . . .             | 1898           |
| Schimmel, Herbert, Ph.D. . . . .       | 2064           |
| Smith, Byron M. . . . .                | 1956           |
| Vaughan, Herbert J., Jr., M.D. . . . . | 2064           |
| Wolfe, Earl A. . . . .                 | 1445           |
| Wood, Eugene J. . . . .                | 1641           |
| Yoder, Norman M., Ph.D. . . . .        | 1901           |



REPORTS RESULTING FROM VOCATIONAL REHABILITATION  
ADMINISTRATION RESEARCH AND DEMONSTRATION PROJECTS  
CONCERNING BLINDNESS

- 315 The Industrial Home for the Blind, Brooklyn, New York 11201.  
Bergman, Moe; Rusalem, Herbert; Malles, Irvin; Schiller, Vera; Cohan, Helen; and McKay, Evelyn. (Keane, George E., Project Director.) Auditory Rehabilitation for Hearing-Impaired Blind Persons. American Speech and Hearing Association Monograph Number 12, March 1965. Published final report.
- 510 The C. W. Shilling Auditory Research Center, Inc., Groton, Connecticut. Harris, J. D., Project Director; Dupress, J. D.; Wright, H. N.; Curtis, J. F.; Winer, D.; Gropper, F. K.; and Kelsey, P. A. Identification and Teaching of Auditory Cues for Traveling in the Blind. Unpublished final report, March 1963.
- 670 Texas Technological College, Lubbock, Texas.  
Anderson, Robert P., Project Director. Raven Progressive Matrices for Presentation to the Blind. Unpublished final report, January 1964.
- 915 The New York Association for the Blind, New York, N. Y. 10022.  
Crawford, Fred L., and Sprague, Wesley D., Project Director. Guidelines for the Counseling and Placement of Blind Persons in Professional Occupations. Published final report, 1965.
- 1094 University of Wichita, Wichita, Kansas.  
Teare, Robert J., Project Director. Tests for the Blind. A comprehensive "set of tailor-made" psychological tests designed specifically for use with the visually disabled. For descriptive brochure of tests, how to order, and prices, address inquiries to: Tests for the Blind, c/o The Champion Press, 7710 Old Springhouse Road, McLean, Virginia 22101.
- 1383 Boston University, Boston, Massachusetts.  
Hanley, Leo F., Project Director. A Diagnostic Test of Grade 2 Braille Misperceptions: A Pilot Study. Unpublished final report, October 1965.
- 1406 California State College at Los Angeles, Los Angeles, California.  
Blaha, Lawrence and Manshardt, Clarice E. (Lord, F. E. Project Director). A Planning Study for Orientation and Mobility Instruction in the Schools of Los Angeles County. Unpublished final report, September 1965.
- 1407 American Foundation for the Blind, New York, New York 10011.  
Graham, Milton D., Project Director. International Research and Information Service for the Blind. Unpublished final report, January 1966.
- 1531 Minneapolis Society for the Blind, Inc., Minneapolis, Minnesota.  
Johnston, Mrs. Lee, Project Director. Housing Needs of Blind Persons in Minneapolis and Hennepin County, Minnesota. Unpublished final report, 1965.

REPORTS RESULTING FROM VOCATIONAL REHABILITATION  
ADMINISTRATION RESEARCH AND DEMONSTRATION PROJECTS  
CONCERNING BLINDNESS (Continued)

- 1618 Florida Council for the Blind, Tallahassee, Florida.  
Martin, Murdock, Project Director. The New Rehabilitation Center of the Florida Council for the Blind at Daytona Beach, Florida. Unpublished final report, 1965.
- RC-8 Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts.  
Bauman, Dwight M.; Mann, Robert W.; and Sheridan, T. B. (Principal Investigators). Evaluation Report on Work in Progress on Sensory Aids and Prosthetics. Unpublished report, April 1964.



# VOCATIONAL REHABILITATION ADMINISTRATION

## INTERNATIONAL RESEARCH ON BLINDNESS

| PROJECT NUMBER | IDENTIFICATION AND COST                                                                                                                                    | GRANTEE AND PRINCIPAL INVESTIGATOR                                                                                                                                    | PURPOSE                                                                                                                                                                                                                                                                                                                                                                         |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VRA-IND-15-65  | The establishment of a pilot demonstration rehabilitation centre for the blind, including an optical aids evaluation unit.<br>Approx. Cost:<br>Rs. 597,000 | Department of Ophthalmology,<br>Madurai Medical College,<br>Madurai, South India<br>Professor G. Venkataswamy,<br>Principal Investigator,<br>Madurai Medical College  | To assist blind people to develop personal and social skills necessary to overcome problems brought about by blindness. To improve the residual visual acuity of visually handicapped persons through the use of low vision aid devices. To help blind people plan for their vocational roles in competitive employment and/or trades leading to self-employment.               |
| VRA-IND-20-65  | Research on methods and techniques of placing suitably trained blind persons into competitive industries.<br>Approx. Cost:<br>Rs. 254,640                  | The Department of Education<br>Government of Madras,<br>Madras, India<br>Mr. B. A. Nandagopaul,<br>Principal, Government School for the Blind,<br>Poonamallee, Madras | An investigation of methods of rehabilitating blind people from Madras and its environs for employment within the newly developing "Industrial Estates" in South India, and determination of the feasibility of setting up a placement and follow-up service for blind trainees in order to fully integrate them into the economic and social life of the "Industrial Estates". |

VOCATIONAL REHABILITATION ADMINISTRATION  
INTERNATIONAL RESEARCH ON BLINDNESS (Continued)

| PROJECT<br>NUMBER    | IDENTIFICATION<br>AND COST                                                                                                                                | GRANTEE AND PRINCIPAL<br>INVESTIGATOR                                                                                                                                                                                                                   | PURPOSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VRA-<br>PAK-9-<br>66 | Development of rehabilitation methods and techniques for the preparation of blind adults for competitive employment.<br>Approx. Cost:<br>Rs. 485,481      | The Adult Blind Centre,<br>36/3 Love Lane,<br>Garden East,<br>Karachi 3, Pakistan<br>Begum M. H. Tyabji,<br>President<br>The Adult Blind Centre,<br>Karachi                                                                                             | To carry out research into the job opportunities available to the blind in industry and commerce in Pakistan; to investigate ways of orienting, rehabilitating, training and placing young adult blind into competitive job opportunities; and to study methods and techniques of adjusting blind persons to new types of employment.                                                                                                                                            |
| VRA-<br>UAR-2-<br>65 | Experimental program for the rehabilitation of the blind in their villages and in rural areas of the United Arab Republic.<br>Approx. Cost:<br>EL 127,844 | Ministry of Social Affairs<br>of the United Arab<br>Republic and the Demon-<br>stration Center for the<br>Blind at Zeiton, Cairo<br>Dr. Salah-El-Din El<br>Hommosanni, Director<br>General, Rehabilitation<br>Department, Ministry<br>of Social Affairs | To experiment with ways of rehabilitating the legally blind as farmers and hand-icraft workers throughout the UAR: to develop rehabilitation methods and techniques which will enable blind persons living in rural areas to become economically independent and fully integrated into the educational, social and vocational life of their families and rural society; to evaluate techniques at present in use in other countries and test their applicability within the UAR. |



VOCATIONAL REHABILITATION ADMINISTRATION  
INTERNATIONAL RESEARCH ON BLINDNESS (Continued)

| PROJECT<br>NUMBER    | IDENTIFICATION<br>AND COST                                                                                                                                | GRANTEE AND PRINCIPAL<br>INVESTIGATOR                                                                                                                                                                                                                                                                                        | PURPOSE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VRA-<br>UAR-4-<br>65 | Establishment of<br>an experimental<br>optical aids clinic<br>in the demonstra-<br>tion center for the<br>blind in Zeiton.<br>Approx. Cost:<br>EL. 36,484 | The UAR Ministry of Social<br>Affairs, Rehabilitation<br>Department; University<br>of Heliopolis, Ophthal-<br>mology Department; and<br>the Demonstration<br>Center for the Blind at<br>Zeiton, Cairo<br>Dr. Salah-El-Din El<br>Hommosanni, Director<br>General, Rehabilitation<br>Department, Ministry<br>of Social Affairs | To demonstrate<br>the use of modern<br>visual aids such<br>as magnifying<br>lenses and other<br>aids now available<br>to improve the<br>visual acuity of<br>persons with very<br>low vision or who<br>are currently clas-<br>sified as blind in<br>order to increase<br>their opportuni-<br>ties for employ-<br>ment. To apply<br>promptly the new<br>knowledge, meth-<br>ods, and tech-<br>niques that have<br>become available<br>in recent years<br>for improving the<br>residual visual<br>acuity of visually<br>handicapped per-<br>sons. |

VOCATIONAL REHABILITATION ADMINISTRATION INTERNATIONAL RESEARCH  
FISCAL YEAR 1965-1966  
NEW GRANTS

| <u>PROJECT NO.</u> | <u>GRANTEE</u>                                                                                                                         | <u>BEGINNING<br/>YEAR</u> | <u>TOTAL<br/>GRANT AWARD*</u> |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------|
| VRA-IND-15-65      | Department of Ophthalmology<br>Madurai Medical College<br>Madurai, South India                                                         | 1965                      | \$148,137                     |
| VRA-IND-20-65      | The Department of Education<br>Government of Madras<br>Madras, India                                                                   | 1965                      | \$ 53,495                     |
| VRA-PAK-9-66       | The Adult Blind Centre<br>36/3 Love Lane, Garden<br>East Karachi 3, Pakistan                                                           | 1966                      | \$101,036                     |
| VRA-UAR-2-65       | Ministry of Social Affairs<br>of the United Arabic Re-<br>public and the Demonstra-<br>tion Center for the Blind<br>at Zeiton<br>Cairo | 1965                      | \$ 29,464                     |
| VRA-UAR-4-65       | University of Heliopolis<br>Ophthalmology Department<br>and Demonstration Center<br>for the Blind at Zeiton<br>Cairo                   | 1965                      | \$ 26,913                     |

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\* Grants are made in local currencies in the participating countries. Amounts shown are U. S. dollar equivalent.



VOCATIONAL REHABILITATION ADMINISTRATION INTERNATIONAL RESEARCH  
FISCAL YEAR 1961-1964  
PROJECT GRANTS\*

| <u>PROJECT NO.</u> | <u>GRANTEE</u>                                                                                                                                                      | <u>BEGINNING<br/>YEAR</u> | <u>TOTAL<br/>GRANT AWARD**</u> |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------|
| VRA-ISR-2-61       | Ministry of Social Welfare<br>Jerusalem, Israel, with Israel<br>Institute of Productivity<br>(Textile Unit)<br>Tel-Aviv, Israel                                     | 1961                      | \$ 87,776                      |
| VRA-ISR-13-64      | Ministry of Social Welfare<br>Jerusalem, Israel, Education<br>Department of the IBM<br>World Trade Corporation<br>(Israel Branch)<br>Jewish Institute for the Blind | 1964                      | \$119,173                      |
| VRA-ISR-14-64      | The Israel Foundation for<br>Guide Dogs for the Blind<br>The Jewish Institute for the<br>Blind<br>Ministry of Social Welfare                                        | 1964                      | \$ 41,193                      |
| VRA-IND-1-64       | Ramakrishna Mission<br>Ashrama<br>P. O. Narendrapur<br>District 24 Parganas<br>West Bengal, India                                                                   | 1964                      | \$ 62,480                      |
| VRA-IND-5-64       | The National Society for<br>the Prevention of Blindness<br>New Delhi, India                                                                                         | 1964                      | \$ 30,433                      |
| VRA-IND-6-63       | The National Association<br>for the Blind<br>Jehangir Wadia Building<br>51 Mahatma Gandhi Road, Fort<br>Bombay 1, India                                             | 1963                      | \$211,058                      |
| VRA-IND-8-61       | The Tata Agricultural & Rural<br>Training Centre for the Blind<br>Jehangir Wadia Building<br>Mahatma Gandhi Road<br>Bombay 1, India                                 | 1961                      | \$236,123                      |
| VRA-IND-11-64      | Christian Medical College and<br>Brown Memorial Hospital,<br>Ludhiana, Punjab, India                                                                                | 1964                      | \$199,842                      |
| VRA-SYR-1-63       | The National Institute<br>for the Blind<br>Nouri Pasha Street<br>Damascus, Syria                                                                                    | 1963                      | \$ 96,250                      |

\* Projects described in Blindness Annual 1964.

\*\* Grants are made in local currencies in the participating countries. Amounts shown are U. S. dollar equivalent.

U.S. OFFICE OF EDUCATION RESEARCH PROGRAMS  
FOR VISUALLY HANDICAPPED

(Division of Handicapped Children and Youth)

| PROJECT NUMBER | IDENTIFICATION DURATION AND COST                                                                                                                                | GRANTEE AND PRINCIPAL INVESTIGATOR                                                    | PURPOSE                                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1005           | A Comparison of the Listening Ability of Blind Students and the Listening Ability of Sighted Students in the Intermediate Grades.<br>15 Months<br>Cost: \$2,500 | Fordham University<br>New York, New York<br>Francis J. Crowley<br>Barbara W. Lake     | To study the effect of blindness, intelligence, and auditory communication rate, kind of material heard, and type of school attended, on the listening.                                                               |
| 1012           | Improvement of Tactual Maps for Children.<br>4 Years<br>Cost: \$27,450                                                                                          | The American Printing House for the Blind<br>Louisville, Kentucky<br>Carson Y. Nolan  | To refine the symbology used on maps; to study methods of designing maps to insure maximum legibility; and to study the amounts and types of information that can be conveyed to blind children through tactual maps. |
| 1013           | A Concentrated Mobility and Orientation Approach for Partially Seeing and Blind Children in Day School Settings.<br>2 Years<br>Cost: \$18,249                   | Kansas State Department of Public Instruction<br>Topeka, Kansas<br>Clara H. Robertson | To demonstrate the effect and importance of an itinerant mobility and orientation instructor for visually impaired children.                                                                                          |
| 1034           | Effects of Experimental Teaching on the Visual Behavior of Children Educated As Though They Had No Vision.<br>9 Months<br>Cost: \$9,996                         | George Peabody College for Teachers<br>Nashville, Tennessee<br>S. C. Ashcroft         | To confirm a previous study which demonstrated significant gains in visual functioning attributed to a short term intensive teaching procedure utilizing visual stimulation with low vision children.                 |



U.S. OFFICE OF EDUCATION RESEARCH PROGRAMS  
FOR VISUALLY HANDICAPPED (Continued)

(Division of Handicapped Children and Youth)

| PROJECT<br>NUMBER | IDENTIFICATION<br>DURATION AND<br>COST                                                                                                                        | GRANTEE AND PRINCIPAL<br>INVESTIGATOR                                                      | PURPOSE                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5015              | Identification of<br>Orientation and<br>Mobility Skills<br>Relating to De-<br>velopmental<br>Tasks for Young<br>Blind Children<br>13 Months<br>Cost: \$32,414 | California State College<br>at Los Angeles<br>Dr. F. E. Lord                               | To identify spe-<br>cific develop-<br>mental tasks nec-<br>essary to enable a<br>blind child to move<br>and travel and to<br>identify the orien-<br>tation and mobility<br>skills and the in-<br>tellectual, psy-<br>chological, and<br>social components<br>associated with<br>each develop-<br>mental task to<br>form a scale to be<br>used as a teaching<br>reference. |
| 6003              | Divergent Think-<br>ing in Blind<br>Children<br>9 Months<br>Cost: \$6,688                                                                                     | University of Kentucky<br>Research Foundation<br>Lexington, Kentucky<br>William J. Tisdall | To study the ef-<br>fects of visual de-<br>privation upon<br>verbal divergent<br>thinking in blind<br>children when<br>compared with<br>visually normal<br>children.                                                                                                                                                                                                      |
| 4-10-127          | The Comprehen-<br>sion of Rapid<br>Speech by the<br>Blind<br>4 Years<br>Cost: \$73,345                                                                        | The University of<br>Louisville, Kentucky<br>Emerson Foulke                                | On the basis of<br>previous studies,<br>to evaluate what<br>appears to be the<br>best training<br>method and to ex-<br>plore those fac-<br>tors which appear<br>to have an impor-<br>tant influence on<br>the compre-<br>hension of rapid<br>speech.                                                                                                                      |

U.S. OFFICE OF EDUCATION RESEARCH PROGRAMS  
FOR VISUALLY HANDICAPPED (Continued)

(Division of Handicapped Children and Youth)

| PROJECT<br>NUMBER | IDENTIFICATION<br>DURATION AND<br>COST                                             | GRANTEE AND PRINCIPAL<br>INVESTIGATOR                                        | PURPOSE                                                                                                                                                                                                                                                                                                       |
|-------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5-10-009          | Methods of Teaching Braille Reading<br>2-1/2 Years<br>Cost: \$77,374               | San Francisco State College<br>San Francisco, California<br>Georgie Lee Abel | To test which methods of teaching braille reading produce better braille readers in terms of reading rate, reading comprehension and general reading achievement.                                                                                                                                             |
| 6-10-035          | Development of an Expanded Reading Code for the Blind<br>2 Years<br>Cost: \$40,343 | University of Louisville<br>Louisville, Kentucky<br>Emerson Foulke           | To attempt to overcome deficiencies in the present Braille code by developing and testing a punctigraphic stimulus alphabet that contains more characters than the present code, and to construct several responses alphabets matched to the stimulus alphabet, including contracted and technical alphabets. |
| 7-32-0580         | Programmed Learning Materials for the Blind                                        | Western Michigan University<br>Kalamazoo, Michigan                           | To study the requirements and format of programmed learning materials suitable for use in the academic training of blind students.                                                                                                                                                                            |



NATIONAL INSTITUTE OF NEUROLOGICAL DISEASES AND BLINDNESS  
CURRENT RESEARCH PROJECTS IN THE AREA OF BLINDNESS

| PROJECT<br>NUMBER | TITLE                                                | INVESTIGATOR(S)                                                                                          | FISCAL<br>YEAR | GRANT<br>AWARD |
|-------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------|----------------|
| NB-03129          | Cues in the Tactual Perception of Braille            | American Printing House for the Blind<br>Louisville, Kentucky<br>Carson Y. Nolan, Ph. D.                 | 1961           | \$ 10,016      |
|                   |                                                      |                                                                                                          | 1962           | 7,960          |
|                   |                                                      |                                                                                                          | 1963           | 8,682          |
|                   |                                                      |                                                                                                          | 1964           | 9,060          |
|                   |                                                      |                                                                                                          | 1965           | 11,832         |
|                   |                                                      |                                                                                                          | 1966           | 8,860          |
|                   |                                                      |                                                                                                          | TOTAL          | \$ 56,410      |
| NB-03336          | Factors in the Success of Guide Dogs for the Blind   | Guide Dogs for the Blind, Inc.<br>San Rafael, California<br>Clarence J. Pfaffenberger                    | 1961           | \$ 30,629      |
|                   |                                                      |                                                                                                          | 1962           | 25,749         |
|                   |                                                      |                                                                                                          | 1963           | 26,828         |
|                   |                                                      |                                                                                                          | 1964           | 26,868         |
|                   |                                                      |                                                                                                          | 1965           | 38,508         |
|                   |                                                      |                                                                                                          | TOTAL          | \$148,582      |
| NB-04226          | Electroencephalography and Severe Visual Deprivation | Northwestern University<br>Evanston, Illinois<br>Jerome Cohen, Ph. D.                                    | 1963           | \$ 19,210      |
|                   |                                                      |                                                                                                          | 1965           | 17,125         |
|                   |                                                      |                                                                                                          | TOTAL          | \$ 36,335      |
| NB-04738          | Quantitative Measures of Echo-ranging in the Blind   | Stanford Research Institute<br>Menlo Park, California<br>Charles E. Rice, Ph. D.                         | 1964           | \$ 81,530      |
|                   |                                                      |                                                                                                          | 1965           | 77,066         |
|                   |                                                      |                                                                                                          | 1966           | 78,906         |
|                   |                                                      |                                                                                                          | TOTAL          | \$237,502      |
| NB-04870          | Reading and Listening in Learning by the Blind       | American Printing House for the Blind<br>Louisville, Kentucky<br>Carson Y. Nolan, Ph. D.                 | 1964           | \$ 22,540      |
|                   |                                                      |                                                                                                          | 1965           | 15,308         |
|                   |                                                      |                                                                                                          | 1966           | 19,350         |
|                   |                                                      |                                                                                                          | TOTAL          | \$ 57,198      |
| NB-05150          | Development of an Electronic Braille System          | George Peabody College<br>Nashville, Tennessee<br>Richard Woodcock, Ed. D.<br>Samuel C. Ashcroft, D. Ed. | 1964           | \$ 43,747      |
|                   |                                                      |                                                                                                          | 1965           | 21,183         |
|                   |                                                      |                                                                                                          | TOTAL          | \$ 64,930      |
| NB-05398          | Classification of Impairment of Visual Function      | Association for the Aid of Crippled Children<br>New York, New York<br>Maya Riviere, Ph.D.                | 1965           | \$ 24,920      |
|                   |                                                      |                                                                                                          | 1966           | 28,150         |
|                   |                                                      |                                                                                                          | TOTAL          | \$ 53,070      |
| NB-06035          | The Effect of Full-time Contact Lens Wear            | Pacific University College of Optometry<br>Forest Grove, Oregon<br>William R. Baldwin, O. D.             | 1965           | \$ 13,424      |
|                   |                                                      |                                                                                                          | 1966           | 6,570          |
|                   |                                                      |                                                                                                          | TOTAL          | \$ 19,994      |
| NB-06412          | Tactile Reading Studies                              | Stanford Electronics Laboratories<br>Stanford, California<br>James C. Bliss, Ph. D.                      | 1966           | \$ 47,984      |
|                   |                                                      |                                                                                                          |                | \$ 47,984      |

BIOMETRICS BRANCH  
NATIONAL INSTITUTE OF NEUROLOGICAL  
DISEASES AND BLINDNESS

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The Model Reporting Area for Blindness Statistics (MRA), sponsored by the National Institute of Neurological Diseases and Blindness and mentioned in the 1964 AAWB Annual "BLINDNESS," now comprises 13 States with a combined population equal to about one-fifth of the United States population. It is expected that within a year the population covered by the MRA will be about one-third of that of the country. Motivated by the two basic objectives of making better statistics available on blind persons and of stimulating research in the field of blindness, the MRA is a voluntary association of States maintaining registers of blind persons which have joined in a cooperative effort to collect uniform information so as to arrive at comparable and meaningful statistics on blindness. Statistical reports covering the reported incidence and prevalence of blindness in the MRA States have been published for the years 1962 and 1963; the 1964 report is in press. A study of the survivorship of blind persons, based on an MRA register, has been completed and is in press. Another study of the relationship of perinatal factors and the occurrence of blindness in children in an MRA State is in process of completion.

Information concerning the MRA may be secured from the Project Director, Hyman Goldstein, Ph. D.; Chief, Biometrics Branch, NINDB, National Institutes of Health, Bethesda, Maryland.



# U.S. VETERANS ADMINISTRATION RESEARCH CONCERNING BLINDNESS

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(This study was completed February 7, 1966, for use in the AAWB Annual. The data are supplementary to similar materials supplied in our earlier documents of March 24, 1964, and January 15, 1965. Only active projects are mentioned here.)

## New Projects

| PROJECT NUMBER             | IDENTIFICATION DURATION AND COST                                             | CONTRACTOR OR GRANTEE ADDRESS                                                                            | PRINCIPAL PERSONNEL                                                     | PURPOSE                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1005P<br>376-A            | Evaluation of the Kay Guidance Device<br>5/11/66 to present<br>Cost: \$7,757 | American Center for Research in Blindness and Rehabilitation<br>770 Centre Street<br>Newton, Mass. 02158 | Leo H. Riley, M.D.<br>Gunther M. Weill, Ph.D.                           | Two instructors are working under supervision of the project director and the project psychologist. Trial training phases have been completed and the formal research of the project using ten subjects has commenced. |
| V1005M<br>1914             | Sensory Aids Subcommittee<br>3/31/65 to present<br>Cost: Not Available       | National Academy of Sciences<br>2101 Constitution Avenue, N. W.<br>Washington, D. C. 20037               | Prof. R. W. Mann, Chairman<br>A. B. Wilson, Jr., Tech. Director<br>CPRD | To provide advisory and consulting services to the Veterans Administration regarding research programs in aids for the blind and deaf.                                                                                 |
| Subcommittee Membership:   |                                                                              |                                                                                                          |                                                                         |                                                                                                                                                                                                                        |
| Robert W. Mann<br>Chairman |                                                                              | Edward L. Glaser                                                                                         |                                                                         |                                                                                                                                                                                                                        |
| Samuel Ashcroft            |                                                                              | Donald R. Griffin                                                                                        |                                                                         |                                                                                                                                                                                                                        |
| James C. Bliss             |                                                                              | Leon D. Harmon                                                                                           |                                                                         |                                                                                                                                                                                                                        |
| Leo G. Doerfler            |                                                                              | Richard E. Hoover                                                                                        |                                                                         |                                                                                                                                                                                                                        |
| Frank A. Geldard           |                                                                              | Jerome Y. Lettvin                                                                                        |                                                                         |                                                                                                                                                                                                                        |
|                            |                                                                              | Patrick W. Nye                                                                                           |                                                                         |                                                                                                                                                                                                                        |

U.S. VETERANS ADMINISTRATION RESEARCH CONCERNING BLINDNESS  
(Continued)

Continuation Projects

| PROJECT<br>NUMBER | IDENTIFICATION<br>DURATION AND<br>COST                                       | CONTRACTOR<br>OR GRANTEE<br>ADDRESS                                                                                             | PRINCIPAL<br>PERSONNEL                                         | PURPOSE                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1005P-<br>297-A  | Object Detection<br>by Pulsed Sound<br>5/4/64 to 7/3/65<br>Cost: \$31,908    | Bionics and<br>Human Fac-<br>tors Acous-<br>tic Research<br>Group<br>Lockheed -<br>California<br>Company<br>Burbank<br>91503    | J. E. Parnell<br>L. J. Shepherd<br>W. W.<br>Sutherland         | Psychoacoustic<br>data were obtained<br>on a number of<br>blindfolded sub-<br>jects regarding<br>capability to<br>detect aurally the<br>presence of an ob-<br>ject using several<br>types of sounds:<br>1) complex DC<br>pulse, 2) bursts of<br>noise, 3) continu-<br>ous noise, 4) dis-<br>crete audio tone.                                                                                              |
| V1005P-<br>365-A  | Optophone Trials<br>10/5/64 to present<br>Cost: \$9,455                      | American<br>Center for<br>Research in<br>Blindness<br>and Rehabil-<br>itation<br>770 Centre<br>Street<br>Newton, Mass.<br>02158 | Leo H.<br>Riley, M.D.<br>Ann<br>Harrington                     | The two subjects<br>in this program<br>averaged 5.5<br>words per minute<br>and 4.0 wpm re-<br>spectively on Test<br>7 (First-Grade<br>level material) in<br>the training<br>series.                                                                                                                                                                                                                        |
| V1005M-<br>1253   | Outputs for<br>Reading Ma-<br>chines<br>4/1/57 to present<br>Cost: \$205,818 | Haskins Lab-<br>oratories,<br>Inc.<br>305 East 43rd<br>New York,<br>N.Y. 10017                                                  | Franklin S.<br>Cooper<br>Robert<br>Epstein<br>Jane<br>Gaitenby | It seems that the<br>best type of syn-<br>thesized audible<br>output for a read-<br>ing machine for<br>the blind will be<br>what has been<br>called re-formed<br>speech since the<br>individual words<br>are from stored<br>instructions based<br>on real speech.<br>Such speech can<br>have intonations<br>and durations ad-<br>justed to give a<br>more natural<br>sound to synthe-<br>sized utterances. |



U.S. VETERANS ADMINISTRATION RESEARCH CONCERNING BLINDNESS  
(Continued)

Continuation Projects

| PROJECT<br>NUMBER | IDENTIFICATION<br>DURATION AND<br>COST                                    | CONTRACTOR<br>OR GRANTEE<br>ADDRESS                                              | PRINCIPAL<br>PERSONNEL                                                              | PURPOSE                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1005M-<br>1254   | Word Reading<br>Machine<br>4/19/57 to present<br>Cost: \$27,000           | Haskins Lab-<br>oratories,<br>Inc.<br>305 East 43rd<br>New York,<br>N. Y. 10017  | Franklin S.<br>Cooper<br>Paul<br>Brubaker<br>Eugene<br>Peterson<br>Jane<br>Gaitenby | Both electro-me-<br>chanical equip-<br>ment technology<br>and linguistic<br>knowledge have<br>advanced so far<br>since the 1957 be-<br>ginnings of this<br>fixed-price con-<br>tract that it no<br>longer seems in<br>the best interests<br>of our total pro-<br>gram to pursue<br>further the origi-<br>nal concepts and<br>plans. We plan to<br>terminate this<br>project and use<br>the information<br>and equipment on<br>related work at<br>Haskins Labs. |
| V1005M-<br>1943   | Personal-Type<br>Reading Machine<br>9/12/58 to present<br>Cost: \$331,163 | Mauch Lab-<br>oratories,<br>Inc.<br>3035 Dryden<br>Road<br>Dayton, Ohio<br>45439 | Hans A.<br>Mauch<br>G. C. Smith                                                     | A laboratory ver-<br>sion of the charac-<br>ter recognition<br>unit has been built<br>and successfully<br>operated. Usable<br>with several type<br>fonts, the machine<br>scans the letters<br>on a page and<br>speaks them back<br>in "spelled<br>speech." Operable<br>hand-held "Viso-<br>tactors," a "Viso-<br>toner," and sev-<br>eral "Colineator"<br>tracking aids have<br>also been built and<br>are undergoing<br>trials.                               |

U.S. VETERANS ADMINISTRATION RESEARCH CONCERNING BLINDNESS  
(Continued)

Continuation Projects

| PROJECT<br>NUMBER | IDENTIFICATION<br>DURATION AND<br>COST                                           | CONTRACTOR<br>OR GRANTEE<br>ADDRESS                                                             | PRINCIPAL<br>PERSONNEL                                                            | PURPOSE                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1005M-<br>1961   | VA-Battelle<br>Optophone<br>7/1/58 to 6/30/65<br>Cost: \$267,802                 | Battelle<br>Memorial<br>Institute<br>505 King Ave.<br>Columbus,<br>Ohio 43201                   | Dr. Wm. D.<br>Hitt<br>John L.<br>Coffey<br>R. R.<br>McFarland<br>C. B.<br>Shields | Development of<br>equipment and<br>training program<br>under this con-<br>tract has been<br>completed. Va-<br>Battelle Model D<br>9-tome opto-<br>phones are in trial<br>use at Akron, O.,<br>Hines, Ill., New<br>York, N. Y., New-<br>ton, Mass., and<br>London, Eng. Con-<br>tract V1005P-<br>365-A is related.                                                                                                                              |
| V1005P-<br>5321   | Spelled Speech<br>11/1/60 to present<br>Cost: \$52,906                           | Metfessel<br>Labora-<br>tories,<br>5100 Victoria<br>Ave.<br>Los Angeles,<br>California<br>90043 | Dr. Milton F.<br>Metfessel<br>Dr. Constance<br>Lovell                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| V1005M-<br>9217   | Obstacle De-<br>tectors for the<br>Blind<br>6/6/61 to present<br>Cost: \$155,763 | Bionic Instru-<br>ments, Inc.<br>221 Rock Hill<br>Road<br>Bala-Cynwyd,<br>Pennsylvania<br>19004 | J. M.<br>Benjamin<br>Prof. T. A.<br>Benham<br>D. R.<br>Bolgiano                   | Field tests have<br>indicated most<br>users find the G-5<br>Obstacle Detector<br>useful, but too<br>large and heavy.<br>A smaller 3-sys-<br>tem cane-mounted<br>unit is in develop-<br>ment. This aid will<br>"look" up to pro-<br>tect against obsta-<br>cles, and down<br>give warning<br>of certain ter-<br>rain discontinui-<br>ties. The cane<br>shaft, as conven-<br>tionally used, will<br>also provide in-<br>formation and<br>safety. |



U.S. VETERANS ADMINISTRATION RESEARCH CONCERNING BLINDNESS  
(Continued)

Continuation Projects

| PROJECT<br>NUMBER | IDENTIFICATION<br>DURATION AND<br>COST                                   | CONTRACTOR<br>OR GRANTEE<br>ADDRESS                                                  | PRINCIPAL<br>PERSONNEL | PURPOSE                                                                                                                                                                                                                                        |
|-------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INTRA-<br>VA      | VA R&D Division<br>Division Work<br>in Aids for the<br>Blind.<br>Current | Research and<br>Development<br>Division<br>Prosthetic and<br>Sensory Aids<br>Service | VA                     | The Sixth Reading<br>Machine Confer-<br>ence was held in<br>Washington, D. C.,<br>1-27-66 and had<br>61 participants. A<br>limited number of<br>copies of minutes<br>will be available<br>from FA R&D Di-<br>vision while the<br>supply lasts. |

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INTRA-  
VA      "BULLETIN OF PROSTHETICS RESEARCH" a semi-annual journal prepared in the Prosthetic and Sensory Aids Service, Veterans Administration, contains notes on the VA research program in aids for the blind. A few remaining copies of issues 1 and 2 BPR 10-1, BPR 10-2 may be available from PSAS. BPR 10-3, Spring 1965, and later numbers can be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20420.

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# THE BEST OF THE PAST FOR THE PRESENT:

## No. 2 OF A SERIES OF REPRINTS

Diderot's Letter on the Blind for the Use of Those Who See

(As addressed to Madame de Puisieux and taken from "Diderot's Early Philosophical Works," translated and edited by Margaret Jourdain; published by Open Court Publishing Co., Chicago and London, 1916)

Possunt nec posse videntur.—*Æneid*, lib. v, 23. (1)

It was not more than I suspected, that the blind girl whom Monsieur de Réaumur had couched for cataract would not inform you of what you were anxious to know; but I little thought it would be neither her fault nor yours. I have in person, and by means of his best friends and by paying him many compliments, applied to her benefactor, but all in vain; the first dressing will be removed without you. Some persons of the highest distinction have had the honour of sharing this refusal with philosophers, and, in a word, he does not wish to remove the veil, except in the presence of some eye-witnesses of no great importance. If you would know why that wonderful operator makes a secret of experiments at which you think too great a number of intelligent witnesses cannot be present, my answer is that the observations of such a celebrated person do not so much stand in need of spectators, whilst making, as of hearers when made.

Thus, disappointed, madam, I have returned to my original intention, and since I was forced to go without an experiment in which I saw little profit would accrue to you or to me, but of which Monsieur de Réaumur will doubtless make a much better use, I set to work to philosophise with my friends upon the important matter which is the object of it. How happy should I be if the narrative of one of our conversations might stand instead of the spectacle I so rashly promised you! The day that the Prussian (2) operated on Simoneau's daughter for cataract, we went to have some talk with the Puisaux (3) man who was born blind. He is possessed of good solid sense, is known to great numbers of persons, understands a little chemistry, and has attended the botanical lectures at the Jardin du Roi with some profit to himself. His father was a distinguished professor of philosophy at the University of Paris. He had private means, sufficient to have satisfied his remaining senses, but a taste for pleasure led him into some excesses in his youth; people took advantage of his weaknesses, his affairs became embarrassed, and finally he withdrew to a little town in the provinces, from whence he pays a yearly visit to Paris, bringing with him liqueurs which give great satisfaction. These, madam, are not very philosophic details, but for that very reason are likely to convince you that the person I am speaking of is not imaginary.

We arrived at our blind man's house about five o'clock in the afternoon, and we found him busy teaching his son to read with raised letters. He had only been up an hour, for I must tell you the day begins for him when it is ending for

us. His custom is to look after his household affairs and to work while others are asleep. At midnight nothing interrupts him, and he is in no one's way. His first care is to set in its place everything that has been displaced during the day, and when his wife wakes she generally finds the house tidy. The difficulty the blind have in finding things that are mislaid makes them orderly, and I have observed that their intimates also share this quality, either from the effect of the good example of the blind, or from a feeling of compassion towards them. How unhappy would the blind be without the little attentions of those about them! — nay, we ourselves feel the want of them. Great services are like the large gold or silver coins that we rarely make use of, but small attentions are small change which is always passing from hand to hand.

This blind man is a good judge of symmetry. Symmetry, which is perhaps a matter of pure convention among us, is certainly so in many respects between a blind man and the sighted. A blind man studies by his touch that disposition required between the parts of a whole to enable it to be called beautiful; and then at length attains to a just application of that term. But in saying "that is beautiful," he does not form an opinion, it is no more than repeating the judgment of those who see; and is not this the case of three-fourths of those who give their opinion on a play or a book? Beauty for the blind is but a word when divorced from utility, and, wanting an organ, how many things are there the utility of which escapes them? Are not the blind very much to be pitied in accounting nothing beautiful unless it be likewise good? How many admirable things are lost to them! The only compensation for their loss is that their ideas of beauty, though less extensive, are more definite than those of many keen-sighted philosophers who have written prolix treatises on the subject. This blind man often speaks of mirrors. You think he does not know the meaning of the word, yet he is never known to put a glass in a wrong light. He speaks as sensibly as we on the qualities and defects of the organ which he lacks. If he attaches no idea to the terms he makes use of, he has the advantage over most other men that he never uses them wrongly. He speaks so wisely and so well of so many things absolutely unknown to him, that his conversation would considerably lessen the weight of that inference which, without knowing wherefore, we all draw from what passes in ourselves to what passes within the minds of others.

I asked him what he meant by a mirror? "An instrument," answered he, "which sets things in relief at a distance from themselves, when properly placed with regard to it. It is like my hand, which, to feel an object, I must not put on one side of it." Had Descartes been born blind, he might, I think, have hugged himself for such a definition. Pray consider what an ingenious combination of ideas it implies. This blind man's only knowledge of objects is by touch. He knows by hearing other men say so that they know objects by sight as he knows them by touch; at any rate that is the only idea he can form of the process. He also knows that we cannot see our own face though we can touch it. Sight, he therefore concludes, is a kind of touch which extends to distant objects and is not applied to our face. Touch gives him an idea only of relief. Therefore, he concludes, a mirror is an instrument that represents us in relief outside ourselves. How many famous philosophers have laboured with less subtlety to arrive at conclusions equally erroneous!

But if a mirror astonished our blind man, how much greater was his surprise when we told him that there are instruments which magnify objects, while others remove them without duplicating them, put them out of their place, bring



them nearer, remove them farther, and reveal the minutest details to the eyes of naturalists; while others again multiply objects a thousand times, and others appear to change the figure of objects completely. He asked us a hundred curious questions concerning these phenomena. For instance, he asked us if only persons who were called naturalists could see with the microscope, and if only astronomers could see with the telescope; if the instrument for enlarging objects were bigger than that for diminishing them; if that which brings them nearer were shorter than that for removing them farther off. But what puzzled him was that the other self, which according to him the mirror represents in relief, should not be tactile.

"So this little instrument," said he, "sets two senses to contradict one another; a more perfect instrument would perhaps reconcile these contradictions, without the object being ever more real for that, and perhaps a third instrument, still more perfect and less illusory, would cause these contradictions to disappear and show us our error."

"And what are eyes, do you suppose?" asked Monsieur de—. "An organ," replied one blind man, "on which the air has the effect this stick has on my hand." That answer amazed us, and while we gazed at one another in astonishment he continued: "When I place my hand between your eyes and an object, my hand is present to you but the object is absent. The same thing happens when I reach for one thing with my stick and come across another."

Madam, only turn to Descartes' *Dioptrics*, and there you will see the phenomena of sight illustrated by those of touch, and the plates full of men busied in seeing with sticks. Descartes, and all the later writers, have not been able to give us clearer ideas of vision; and that great philosopher was, in this respect, no more superior to the blind man than a common man who has the use of his eyes.

No one thought of asking him questions as to painting and



FIG. 1.

The above figure is an enlarged reproduction of the cut in the original edition of the *Letter on the Blind*. In the *Discours de la méthode, plus la dioptrique, les météores, la mécanique et la musique* (Leyden, 1637), blind people trying to see with sticks are often repeated, but these are small figures only an inch in height dressed as beggars and accompanied by a dog. Diderot probably refers to an edition by P. N. Poisson of this work (1724).—(A)

writing, but it is obvious that his comparison would fit in with every question, and I make no doubt but that he would have told us that to try to read or to see without eyes was like looking for a pin with a thick stick. We only talked to him about those kinds of glasses which exhibit objects in relief, and which are both so very similar to and so very different from mirrors; but these we perceived rather contradicted than coincided with his idea of a looking-glass, and he was apt to think that a painter might perhaps paint a looking-glass, and thus it came to represent objects in colours.

We saw him thread very fine needles. May, I ask you, madam, to suspend your reading for a while and try what you would do in his place? In case you do not light upon any expedient, I will tell you of our blind man's. He takes the eye of the needle transversely between his lips and in the same direction as his mouth, then by his tongue and suction he draws in the thread, which follows his breath unless it is much too thick for the eye; but in that case a man with sight is in the same difficulty as the blind.

He has a surprising memory for sounds, and can distinguish as many differences in voices as we can in faces. He finds in these an infinite number of delicate gradations which escape us because we have not the same interest in observing them. For us, these shades of difference are like our own countenance. Of all the men we have seen, the one we least remember is our own self. We notice faces to recognise people; and if we do not remember our own, it is because we are never liable to mistake ourselves for another person or another for ourselves. Moreover, the mutual aid our senses lend stands in the way of their perfection. This will not be the only occasion where I shall have to remark upon this.

On this head our blind man said: "That he should think himself a pitiable object in wanting those advantages which we enjoy, and that he should have them inclined to consider us as superior beings had he not a hundred times found us very much inferior to him in other respects." This reflection led to another. This blind man, we said, values himself as much as, and perhaps more than, we who see. Why then, if the brute reasons (and it is scarce to be doubted), why on weighing its advantages over man as better known to it than those of man over it, should it not make a similar inference? He has arms, perhaps says the gnat, but I have wings. He has weapons, says the lion, but have we not claws? The elephant would look on us as insects; and all the animals, while allowing us reason, with which we should at the same time stand in great need of their instinct, would claim that with their instinct they could do very well without our reason. We have such a strong desire to exaggerate our qualities, and make little of our defects, that it would seem man's part to write a treatise on force, and animals' on reason.

One of our company bethought him of asking our blind man if he would like to have eyes. "If it were not for curiosity," he replied, "I would just as soon have long arms: it seems to me my hands would tell me more of what goes on in the moon than your eyes or your telescopes; and besides, eyes cease to see sooner than hands to touch. I would be as well off if I perfected the organ I possess, as if I obtained the organ which I am deprived of."

Our blind man points with such exactness at the place whence a noise comes that I make no doubt the blind may, by practice, become very dexterous and very dangerous. I will tell you a story which will convince you how imprudent it would be to stand the throwing of a stone or discharging of a pistol by a blind man, were he in the least used to that weapon. He had in his youth a quarrel with one of his brothers, who came off badly. Provoked at some insulting



language, he seized the first missile which came to hand, threw it at him, and hit him directly on the forehead, so as to lay him flat on the ground.

This, with some other occurrences of the like kind, caused him to be brought before the police. The outward show of power, which affects us so strongly, is as nothing to the blind. Our blind man appeared before the magistrate, as before an equal; menaces did not intimidate him. "What will you do to me?" he asked Monsieur Hérault.<sup>(4)</sup> "I will commit you to a dungeon," answered the magistrate. "Ah, sir," the blind man replied, "I have been in one for twenty-five years." There was an answer, madam; and what a text for one who is so fond of moralising as your humble servant! We quit life as we would a charming scene, the blind leave it as a dungeon; and if we have more pleasure in living than he, he has less reluctance to meet his end.

The blind man of Puisaux judges of his nearness to the fire by the degrees of heat; of the fulness of vessels by the sound made by liquids which he pours into them; of the proximity of bodies by the action of the air on his face. He is so sensitive to the least atmospheric change, that he can distinguish between a street and a closed alley. He is an extremely good judge of the weight of bodies and the capacity of vessels; and he has trained his arms to be such an exact balance, his fingers to be such skilful compasses, that in this kind of statics I would always back our blind man <sup>(5)</sup> against twenty persons with all their eyes about them. The smooth surface of bodies has as many shades of difference for him as the sound of voices, and there is no risk of his mistaking his wife for another, unless he was to be the gainer by the change. Yet it is very probable that among a blind people wives would be in common, or their laws against adultery must be severe indeed, so very easy would it be for wives to deceive their husbands by concerting a sign with their gallants.

He judges of beauty by touch — that is easy to understand; but what is not so easy to grasp is that his judgment is influenced by pronunciation and the sound of a voice. Anatomists ought to tell us if there is any relation between the parts of the mouth and palate and the exterior conformation of the face. He can turn small articles on the lathe, and do needlework; he levels with a square; he puts together and takes to pieces simple machines. He is so far skilled in music as to play a piece when he has been told the notes and their value. He judges of the duration of time much more accurately than we by the succession of actions and of thoughts. A smooth skin, firm flesh, an elegant shape, sweet breath, charm of voice and graceful pronunciation are qualities he prizes very highly.

He married to have eyes of his own. Before this, he had an idea of taking a deaf man as his partner, to whom he could lend ears in exchange for eyes. I could not sufficiently wonder at his singular address in a great many things; and on our expressing our surprise, "I perceive, gentlemen," said he, "that you are not blind: you are astonished at what I do, and why not as much at my speaking?" There is more philosophy, I believe, in this answer of his than he was aware of. The facility with which we are brought to speak is not a little surprising. We have a number of ideas which cannot be represented by sensible objects, and which have no substance, as it were, and we are obliged to find terms for them by making use of a number of ingenious and profound analogies observed between them and the ideas they suggest. Thus a blind man should find greater difficulty in learning to speak because there is a much larger number of imperceptible objects in his world, and thus his field for comparing and combining is much more limited. How, for example, can he rightly use the word expression (of countenance)? It is the same of many things imperceptible to the blind; and for us who see, it is often found hard to explain very precisely

what it is. If it largely resides in the eye, touch will be useless; and what does a blind man make of dead eyes, or sparkling or expressive eyes? I infer from thence that we unquestionably derive great advantages from the concurrence of our senses and our organs; still, it would be quite another thing did we use them separately, and never employed two when one would suffice. To add touch to sight, when sight would do the business, is like putting to a carriage with two stout horses a third, which will draw one way while the others draw another.

As to me it has always been very clear that the state of our organs and our senses has a great influence on our metaphysics and our morality, and that those ideas which seem purely intellectual are closely dependent on the conformation of our bodies, I put some questions to the blind man about the virtues and vices. The first thing I remarked was his extreme abhorrence of theft; possibly from two reasons—firstly, the facility with which people could steal from him unobserved, and secondly (and still more perhaps), because he could be immediately seen were he to go about filching. Not that he is at any loss to secure himself against that sense which he knows we have above him, or that he is clumsy at hiding what he might steal. Modesty he makes no great account of. If it were not for the weather, against which clothes are a protection, he would hardly understand their use; and he openly admits he cannot see why one part of the body should be hidden rather than another; and still less by what caprice some of those parts should be especially singled out, which from their use and the indispositions to which they are subject ought rather to be kept free. Though living in an age when philosophy has rid us of a great number of prejudices, I do not think we shall ever arrive at such complete insensibility to the prerogatives of modesty as this blind man. Diogenes would have been no philosopher in his account.

As of all the external signs which raise our pity and ideas of pain the blind are affected only by cries, I have in general no high thought of their humanity. What difference is there to a blind man between a man making water and one bleeding in silence? Do not we ourselves cease to be compassionate when distance or the smallness of the objects produces on us the same effect as deprivation of sight upon the blind? So much do our virtues depend on the sensations we receive, and the degree by which we are affected by external things. I don't doubt that if it were not for the fear of punishment, many people would find it less disagreeable to kill a man at a distance at which he would appear no bigger than a swallow, than to cut an ox's throat with their own hands. We pity a horse in pain, and we make nothing of crushing an ant; and is it not by the same principle that we are moved? Ah, madam, how different is the morality of the blind from ours? How different would that of a deaf man likewise be from his? And to one with a sense more than we have, how deficient would our morality appear—to say nothing more? Our metaphysics and theirs agree no better. How many of their principles are mere absurdities to us, and vice versa? Concerning this I might enter into details, which I am pretty certain would amuse you, but which certain people, who make a crime of everything, would not fail to exclaim against as profanity and infidelity, as if it were in my power to make the blind perceive things otherwise than they do. I will content myself with one observation, which everyone must allow, and that is, that the great argument for the wonders of nature falls flat upon the blind. The facility with which we create (if I may say so) new objects by means of a little glass, is something more incomprehensible to them than the stars which they have been condemned never to see. This luminous globe which moves from east



to west surprises them less than a small fire which they can increase or diminish at will; and as they see matter in a more abstract manner than we do, they are less indisposed to believe that it thinks.

If a man who had had sight only for a day or two found himself in the midst of a blind people, he would either have to hold his peace or be considered a brain-sick fool. Every day he would come out with some new wonder, which would only be such to them, and which their free-thinkers would oppose tooth and nail. Might not the apologists of religion greatly avail themselves of such a stubborn unbelief, which, however just in some respects, is yet so very ill-founded? Be pleased to dwell only a little upon this supposition; it will remind you of the persecutions undergone by those poor wretches who discovered truth in the dark ages and were rash enough to reveal it to their blind contemporaries, and found their bitterest enemies were those who from their circumstances and education would have seemed most likely to receive it willingly.

So much for the morals and metaphysics of the blind. I now pass on to less important matters, which have nevertheless lately been the chief subject of observation with regard to the blind ever since the Prussian oculist's arrival. First question: How can a man born blind form ideas of figures? By the movements of his own body and by stretching his hand in various directions, by passing his fingers continuously over an object, he gets an idea of space. If he passes his fingers along a taut thread, he obtains the idea of a straight line; if he follows the curve of a slack thread, that of a curve. In a more general sense, by repeated usage of the sense of touch, he has a memory of sensations experienced at different points; and he is capable of combining these sensations or points and forming figures. A straight line for a blind man who is not a geometrician is but the memory of a series of sensations of touch upon a taut thread; a curve, the memory of a series of tactile sensations referred to the surface of some concave or convex solid. In the case of a geometrician, study corrects the idea of these lines by their properties which he discovers. But whether geometrician or no, the man born blind refers everything to his fingers' ends. We combine coloured points, he only palpable points, or, to speak more precisely, only such tactile sensations as he remembers. He does not go through a mental process analogous to ours; he does not create an image, for to do this it is necessary to colour a background and mark upon it points of a different colour from that background. Make these points of the same colour as the ground, and they are at once lost in it, and the figure disappears; at any rate, that is the case in my imagination, and I suppose all imaginations are alike. When I propose to perceive in my head a straight line otherwise than by its properties, I begin by spreading in it a white cloth, against which I set out a series of black points in the like direction. The stronger the colour of the ground and points, the clearer my perception of the points. To view in my imagination a figure of a colour resembling that of the ground, puts me to no less trouble than if out of myself and on a canvas. You see then, madam, that laws might be given for imagining with ease various objects variously coloured, but such laws are by no means calculated for one born blind. Such a man who cannot colour (and consequently cannot figure as we understand it) only remembers such sensation as one derives from touch, which he refers to different points, places and distances, and of which he composes figures. I believe that we who see never imagine any shape without colouring it, and that if we are given little balls in the dark, whose substance and colour are unknown to us, we shall immediately think of them as black or white, or some other colour; and that if we did not, we, like the blind man, should have the remembrance only of little sensations excited at our fingers' ends, and such as little round

bodies may occasion. If this remembrance be very fleeting with us, if we have very little idea how one born blind fixes, recalls and combines the sensations of touch, it is owing to the custom we derive from our eyes of realising everything in our imagination by means of colours. It has happened, however, that during the agitations of a violent passion I felt a thrill run through my whole hand, and I felt the impression of the bodies I had touched some time ago revived as vividly as if they had been still present to my touch, and I realised very distinctly that the limits of sensation exactly coincided with those of these absent bodies. Although sensation by itself is indivisible, it occupies, if one may use the word, an extension in space to which the blind man is able to add and subtract, mentally by enlarging or diminishing the parts affected. By this means he compares points, surfaces, and solids; and he could imagine a solid as large as this terrestrial globe, if he were to imagine his fingers' ends as large as this globe, and occupied by sensation in its length, breadth, and depth. I know of nothing which is a better proof of the reality of this internal sense than this faculty, weak in us, but strong in those born blind, of feeling or recalling the sensation of bodies when they are absent and no longer acting on us. We cannot make a blind man understand how imagination represents absent objects as present to us, but we can easily recognise in ourselves the faculty that the blind possess of feeling at one's fingers' ends an absent body. To do this, press the forefinger and thumb together, shut your eyes; separate your fingers, and immediately after this separation examine yourself and tell me if the sensation does not linger after the pressure has ceased; if, while the pressure lasted, your mind appears to be in your head rather than at the ends of your fingers, and if this pressure does not convey the nature of a surface by the space which the sensation occupies? We only distinguish the presence of external things from their picture in our imagination by the strength or weakness of the impression; and similarly, the blind only distinguish the sensation from the actual presence of an object at their fingers' ends, by the strength or weakness of that sensation.

If ever a philosopher, blind and deaf from his birth, were to construct a man after the fashion of Descartes, I can assure you, madam, that he would put the seat of the soul at the fingers' ends, for thence the greater part of the sensations and all his knowledge are derived. Who is to inform him that his head is the seat of his thoughts? If the labours of the imagination tire our brain, this is because the effort we make to imagine is somewhat similar to that to perceive very near or very small objects. But this would not be the case with a man blind and deaf from his birth, for the sensations which he has gathered from touch will be the world, so to speak, of all his ideas, and I should not be surprised if, after a profound meditation, his fingers were as wearied as our heads. I am not afraid that a philosopher might object to such a one that the nerves cause our sensations and that they all start from the brain. Were these two propositions fully demonstrated, which is very far from being the case, especially the former, an exposition of all the dreams of naturalists on this head would be sufficient to confirm him in his opinion.

But if the imagination of the blind man be no more than the faculty of calling to mind and combining sensations of palpable points; and of a sighted man, the faculty of combining and calling to mind visible or coloured points, the person born blind consequently perceives things in a much more abstract manner than we; and in questions purely speculative, he is perhaps less liable to be deceived. For abstraction consists in separating in thought the perceptible qualities of a body, either from one another, or from the body itself in



which they are inherent; and error arises where this separation is done in a wrong way or at a wrong time—in a wrong way in metaphysical questions, or at a wrong time in applied mathematics. There is perhaps one certain method of falling into error in metaphysics, and that is, not sufficiently to simplify the subject under investigation; and an infallible secret for obtaining incorrect results in applied mathematics is to suppose objects less compounded than they usually are.

There is one kind of abstraction of which so few are capable that it seems reserved for purely intellectual beings, and that is that by which everything would be reduced to numerical units. We must admit that the results of this geometry would be very exact, and its formulas very comprehensive, for there are no objects, either possible or actually existent, which these simple units could not represent, by points, lines, surfaces, solids, thoughts, ideas, sensations, etc.; and if this should prove to be the foundation of Pythagoras's doctrine, he might be said to have failed in his aim, his mode of philosophising being too much above us, and too near that of the Supreme Being, who, according to the ingenious phrase of an English geometrician,(6) always geometrises in the universe.

But units pure and simple are too vague and general symbols for us. Our senses bring us back to symbols more suited to our comprehension and the conformation of our organs. We have arranged that these signs should be common property and serve, as it were, for the staple in the exchange of our ideas. We have made them for our eyes in the alphabet, and for our ears in articulate sounds; but we have none for the sense of touch, although there is a way of speaking to this sense and of obtaining its responses. For lack of this language, there is no communication between us and those born deaf, blind, and mute. They grow, but they remain in a condition of mental imbecility. Perhaps they would have ideas, if we were to communicate with them in a definite and uniform manner from their infancy; for instance, if we were to trace on their hands the same letters we trace on paper, and associated always the same meaning with them.

Is not this language, madam, as good as another? Is it not ready to hand, and would you dare to say that you have never been communicated with by this method? Nothing remains but to fix it, and make its grammar and dictionaries, if it is found that the expression by the common characters of writing is too slow for the sense of touch. Knowledge has three entrances by which it reaches our mind, and we keep one barricaded for want of signs. If the two others had been neglected we should now be little better than beasts. Just as a pressure is the only sign we have to the touch, so a cry would have been the only sign to the hearing. We have to lose one sense before we realise the advantage of symbols given to the remainder, and people who have the misfortune to be born deaf, blind, and mute, or who have lost these three senses by some accident, would be delighted if there existed a clear and precise language of touch.

It is much easier to use symbols already invented than to invent them, as one is obliged to do when there are none current. What an advantage it would have been for Saunderson to find an arithmetic arranged with signs for the touch all ready to hand at the age of five, instead of having to invent it at twenty-five! This Saunderson, madam, is another blind man whose story you

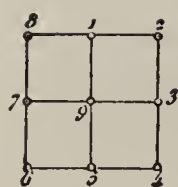


Fig. 2.

will be interested to hear. Wonderful stories, indeed, are told of him, and yet there is not one to which, from his attainments in literature and his skill in mathematics. we may not safely give credit. He used the same machine for algebraical calculations and for the description of rectilinear figures. You would be interested in an account of this if intelligible, and you will see my description assumes no more knowledge on your part than you actually possess, and that it would be very useful to you if you should ever want to make long calculations by touch.

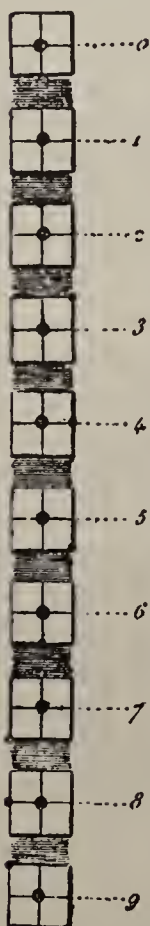


Fig. 3.

Imagine a square such as you see in figures 2 and 3, divided into four equal parts by lines perpendicular to the sides, in such a way that it gives nine points, 1, 2, 3, 4, 5, 6, 7, 8, 9. Suppose this square perforated with nine holes to hold pins of two kinds, both of the same length and thickness, but one kind with a head larger than that of the other.

The large-headed pins are only placed in the centre of the square, the small-headed pins only on the sides, except in the single case of zero. Zero is marked by a large-headed pin placed in the centre of the small square which has no pin set on the sides. The figure 1 is represented by a small-headed pin, placed in the centre of the square, which has no pin set on its sides. The figure 2, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 1. The figure 3, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of its sides at the point 2. The figure 4, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 3. The figure 5, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 4. The figure 6, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of its sides at the point 5. The figure 7, by a large-headed pin placed in one of the sides at the point 6. The figure 8, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 7. The figure 9, by a large-headed pin placed in the centre of the square, and by a small-headed pin placed in one of the sides at the point 8.

This gives ten different symbols for the sense of touch, each of which corresponds to one of our ten arithmetical characters. Now imagine a board as large as you choose, divided into small squares arranged horizontally and separated by a small space one from the other, as you see in fig. 4, and you have Saunderson's instrument.

You can easily see that there is no number which cannot be expressed in the tablet, and hence no arithmetical process which cannot be carried out therein.

Suppose, for example, that we want to find the sum of, or to add, the nine following numbers: —



|   |   |   |   |   |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| 2 | 3 | 4 | 5 | 6 |
| 3 | 4 | 5 | 6 | 7 |
| 4 | 5 | 6 | 7 | 8 |
| 5 | 6 | 7 | 8 | 9 |
| 6 | 7 | 8 | 9 | 0 |
| 7 | 8 | 9 | 0 | 1 |
| 8 | 9 | 0 | 1 | 2 |
| 9 | 0 | 1 | 2 | 3 |

I write them on the table in the order they are named: the first figure on the left of the first number, on the first square to the left of the first line; the second figure on the left of the first number, on the second square on the left of the same line, and so on.

I place the second number in the second row of squares; units are units, tens are tens, etc.

I place the third number in the third row of squares, and so on, as you see in fig. 4. Next, touching with my fingers each vertical row from the top to the bottom, beginning with that which is most to my left, I add together the numbers therein expressed; and I write the tens that are over at the end of that

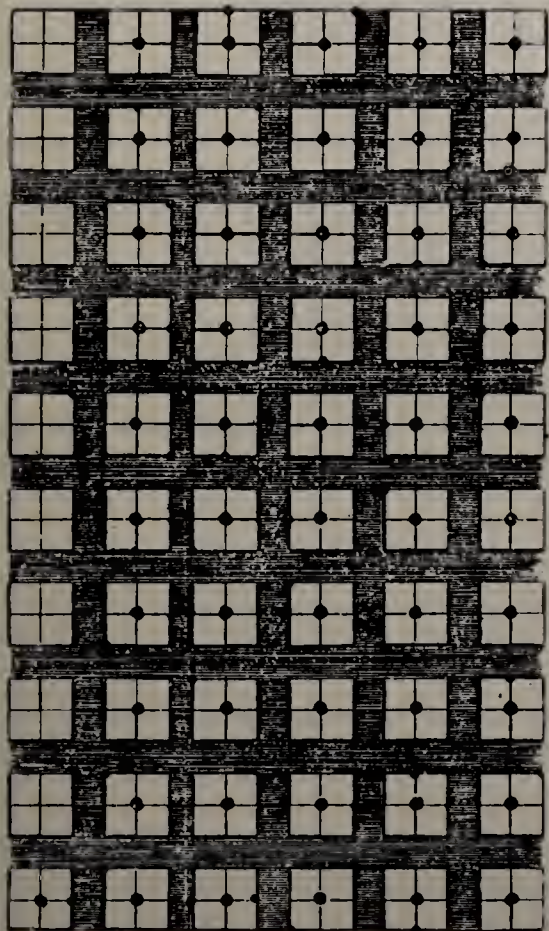


Fig. 4.

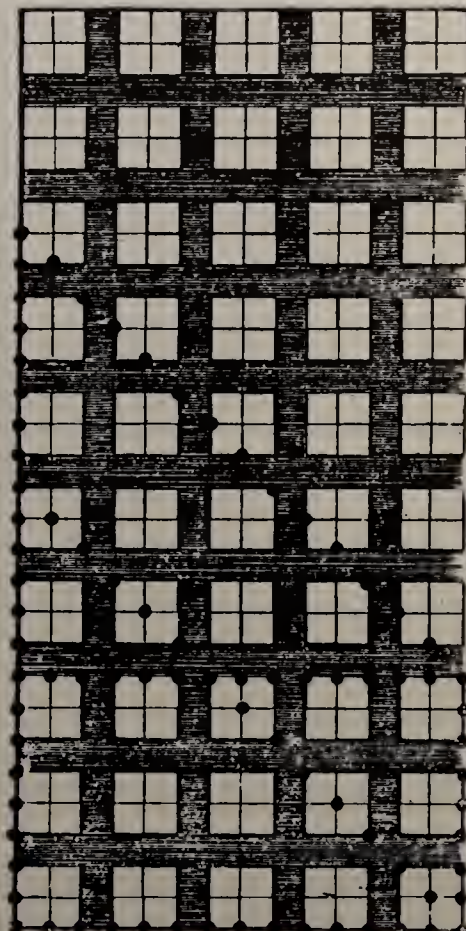


Fig. 5.

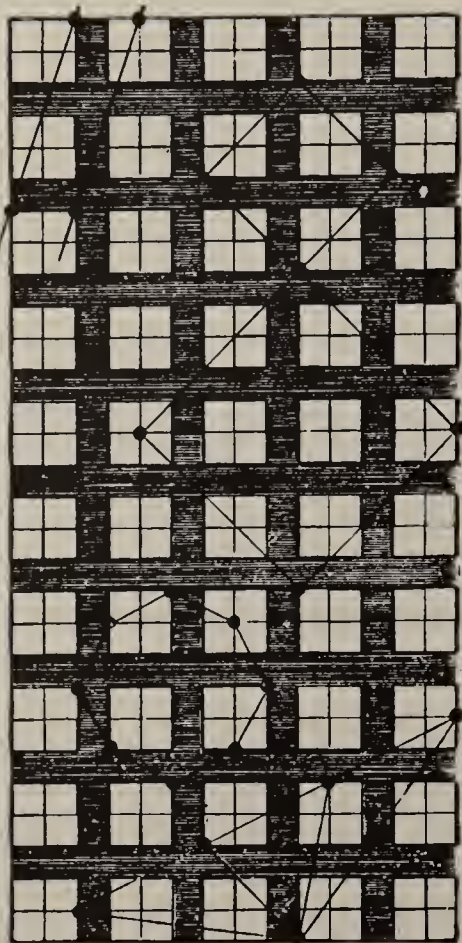


Fig. 6.

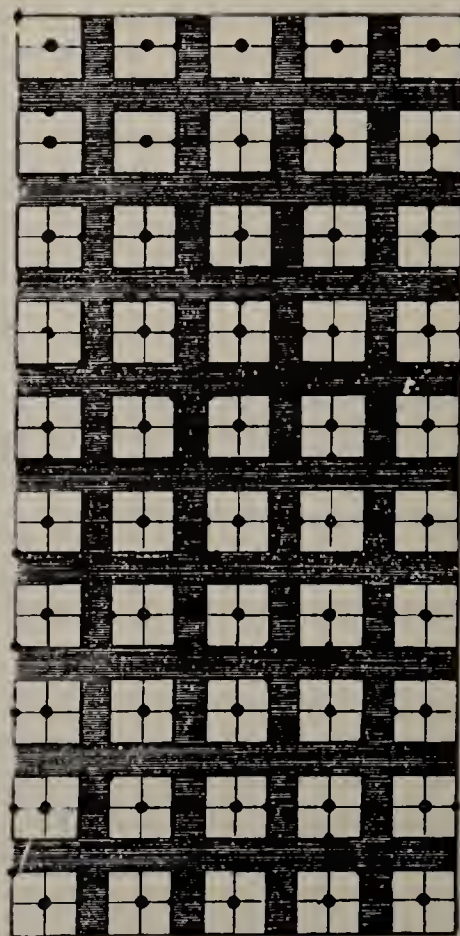


Fig. 7.

column. I pass to the second column, moving leftward, and work in this way; thence to the third, and so on completing my addition.

This is how the same tablet served him to prove the properties of rectilinear figures. Supposing he had to prove that parallelograms which have the same base and same height are equal in area, he placed his pins as you see in fig. 5; he added names to the angles, and proceeded with the proof with his fingers.

Supposing that Saunderson only used large-headed pins to mark the limits of his fingers, he could arrange round these small-headed pins of nine different varieties with all of which he was familiar. Thus he was never at a loss, except in cases where the great number of angular points which he was obliged to name in his proof forced him to have recourse to the letters of the alphabet. We are not told how he used them.

We only know that his fingers moved over his tablet with astonishing rapidity; that he made the longest calculations successfully; that he could interrupt them, and recognise when he was in error; that he could verify them with ease; and that this work did not take him as much time as one might imagine, because he could arrange his tablet to suit his convenience.



This arrangement consisted of placing large-headed pins in the centre of all the squares. This done, he had only to fix their value by small-headed pins, except in the case when he wished to express a unit. In that case he put a small-headed pin in the centre of the square, in place of the large-headed pin.

Sometimes, instead of forming a complete line with pins, he only placed them at all the angles or points of intersection, and round these he stretched silk threads which completed his figures (see fig. 6).

He left several other instruments which facilitated his geometrical studies; the use he made of these is not known, and more acumen would perhaps be



required to discover this than to solve some problem in integral calculus. Let some geometrician try to discover the function of four pieces of solid wood in the form of rectangular parallelpipeds, each 11 inches by 5-1/2 wide and a little more than half an inch thick, and whose two larger opposite surfaces were divided into small squares similar to the abacus I have just described; but with this difference, that they were only perforated at certain points, in which pins were driven in up to their head. Each surface had nine small arithmetical tablets, each with ten numbers, and each of these ten numbers was composed of ten figures. Fig. 7 represents one of the small tablets, and here are the numbers it contained: —

|   |   |   |   |   |
|---|---|---|---|---|
| 9 | 4 | 0 | 8 | 4 |
| 2 | 4 | 1 | 8 | 6 |
| 4 | 1 | 7 | 9 | 2 |
| 5 | 4 | 2 | 8 | 4 |
| 6 | 3 | 9 | 6 | 8 |
| 7 | 1 | 8 | 8 | 0 |
| 7 | 8 | 5 | 6 | 8 |
| 8 | 4 | 3 | 5 | 8 |
| 8 | 9 | 4 | 6 | 4 |
| 9 | 4 | 0 | 3 | 0 |

He was the author of an excellent work of its kind—The Elements of Algebra (7)—where the only signs of his blindness are the peculiarity of certain demonstrations which a sighted man would probably not have thought of. To him we owe the division of the cube into six equal pyramids whose apex is at the centre of the cube and the base of each is one of its faces. This is used by him as a simple proof that every pyramid is the third of a prism having the same height and the same base. His taste for mathematics, his small means, and the advice of his friends decided him to give public lectures. His marvellous facility for clear demonstration encouraged his friends to think he would prove a successful teacher, for he taught his pupils as if they could not see, and a blind man who makes himself clear to the blind must be doubly lucid to the sighted; it is a telescope the more.

His biographers say that his talk abounded in happy expressions, and I can well believe it. But "What do you mean by happy expressions?" you will perhaps inquire. I answer, madam, it is using expressions to one sense (touch, for example) which are also metaphorical to another sense (say, sight): as a result, a double light is shed on the subject for the hearer, the direct light is shed on the subject for the hearer, the direct light of the natural use of the expression and the reflected light of the metaphor. It is evident that in these cases, Saunderson, with all his intelligence, was not aware of the full force of the terms he employed, since he only realised half of the ideas attached to these terms. But does not this happen to all of us at times? It may happen to idiots, who sometimes make excellent jokes, and clever folk who say a foolish thing, without either being aware of it. I have observed the want of words produces the like effect in foreigners, who in an unfamiliar language are obliged to say everything in very few words, some of which they unknowingly use very happily. But every language being to writers of a lively imagination deficient in fit words, they are in the same case as clever foreigners: the situations invented by them, the delicate gradations they perceive in characters, the natural scenes they draw, are continually leading them away from ordinary locutions and causing them to adopt turns of phrases which never fail to charm when they are neither precious nor obscure. These are faults which are more or less readily forgiven, according to the reader's wit and knowledge of the language. This is why M. de M— (8) is the French author who most pleases the English, and Tacitus, of all the classics, bears the bell among the thinkers; they do not attend to the licences of the style, it is only the truth of the expression which strikes them.

Saunderson was extremely successful as professor of mathematics at the University of Cambridge. He gave lessons in optics, he lectured on the nature of light and colours, he explained the theory of vision; he wrote on the properties of lenses, the phenomena of the rainbow, and many other subjects connected with sight and its organ.



These facts lose much of their marvellous character when you consider that there are three distinct elements in a question in which both physics and geometry enter—the phenomenon to be explained, the hypotheses of the geometrician, and the resultant calculation. Now it is manifest that, however great the penetration of the blind man, the phenomena of light and colour are unknown to him. The hypotheses he will understand, as all of them relate to palpable causes; but the geometrician's reason for preferring them to others will be out of his ken, as in order to see that he must be able to compare the hypotheses themselves with the phenomena. Therefore the blind man takes the hypotheses for what they are given him, a ray of light for a fine and elastic thread, or for a succession of minute bodies striking our eyes with incredible velocity, and he makes his calculations accordingly. The transition is made from physics to geometry, and the question becomes purely mathematical.

But what are we to think of the results of the calculation? Firstly, that is sometimes extremely difficult to obtain them, and that it would be to little purpose that a man of science could form the most plausible hypotheses, were he not able to verify them by geometry; accordingly the greatest physicists, Galileo, Descartes, and Newton, were great geometricians. Secondly, the results are more or less certain, as the preliminary hypotheses are more or less complex. When the calculation is based on a simple hypothesis, the conclusions have the validity of geometrical proofs. When there are a great many suppositions, the probability of each hypotheses being true diminishes in the ratio of the number of these hypotheses; but on the other hand increases owing to the improbability that so many false hypotheses could be mutually corrective and produce a result confirmed by the phenomena. A parallel to this would be an addition, of which the sum was correct although the sum of groups of numbers had been wrongly added up. We must admit that such a result is possible, but at the same time you see that it would very seldom prove so. The greater the number of numbers to be added, the greater the probability of error in the addition of each, but at the same time this probability is lessened if the result of the operation be right. There are therefore a number of hypotheses, the certainty resulting from which would be the least possible. If I make  $A + B + C = 50$ , must I conclude from 50 being the real quantity of the phenomena that the suppositions represented by the letters  $A$ ,  $B$ ,  $C$  are true? Not at all, for there are numberless ways of subtracting from one of these letters and adding to the others which would always give 50 as the result. But the case of three combined hypotheses is perhaps one of the most disfavourable.

One advantage of calculation which I must not omit is, that the contrariety found between the result and the phenomenon excludes false hypotheses. If a man of science proposes to find the curve formed by a ray of light in passing through the atmosphere, he must regulate himself by the density of the strata of air, the law of refraction, the nature and form of the luminous corpuscles, and perhaps other essential factors which he does not include in his calculation, either because he does not know them or because he deliberately leaves them out of consideration. He then determines the curvature of the ray. If the actual curve differs from that of his calculation, his hypotheses are incomplete or false. If the actual curvature agrees with that of his calculation, there are two alternatives: first that his hypotheses were mutually corrective, secondly that they were correct. But which is true? He does not know, and yet that is the certitude to which he can attain.

I read Saunderson's Elements of Algebra carefully in hopes of meeting what I was desirous of knowing from those who knew him intimately, and who

have related some particulars of his life; but my curiosity was baffled, and it occurred to me that elements of geometry from him would have been a work both more singular in itself and of greater use to us. We should have found in it definitions of point, line, surface, solid, angle, intersections of lines, and planes, in which I make no question but he would have proceeded on principles of very abstract metaphysics, closely allied to that of the idealists. Those philosophers, madam, are termed idealists who, conscious only of their own existence and of a succession of external sensations, do not admit anything else; an extravagant system which should to my thinking have been the offspring of blindness itself; and yet, to the disgrace of the human mind and philosophy, it is the most difficult to combat, though the most absurd. It is set forth with equal candour and lucidity by Doctor Berkeley, Bishop of Cloyne, in three dialogues. (9) It were to be wished that the author of the *Essay on the Origin of Human Knowledge* (10) would take this work into examination; he would there find matter for useful, agreeable, and ingenious observation—for which, in a word, no person has a better talent. Idealism deserves an attack from his hand, and this hypothesis is a double incentive to him from its singularity, and much more from the difficulty of refuting it in accordance with his principles, which are the same as those of Berkeley. According to both, and according to reason, the terms essence, matter, substance, agent, etc., of themselves convey very little light to the mind. Moreover, as the author of the *Essay on the Origin of Human Knowledge* judiciously observes, whether we go up to the heavens, or down to the deeps, we never get beyond ourselves, and it is only our own thoughts that we perceive. And this is the conclusion of Berkeley's first dialogue, and the foundation of his entire system. Would you not be curious to see a trial of strength between two enemies whose weapons are so much alike? If either got the better it would be he who wielded these weapons with the greater address; the author of the *Essay on the Origin of Human Knowledge* has lately given in his *Treatise on Systems* additional proof of his adroitness and skill and shown himself a redoubtable foe to the systematics.

We have wandered far from the blind, you will say. True, madam, but you must be so good as to allow me all these digressions; I promised you a conversation, and I cannot keep my word without this indulgence.

I have read as carefully as it was in my power what Saunderson has said on the infinite; and I assure you he had such very just and very clear notions on the subject that in his account most of our infinitarians would have been looked on but as blind. You yourself shall be judge: though this matter be somewhat difficult, and a little beyond your mathematical knowledge, I trust to bring it within your grasp and initiate you into the logic of the infinite.

The case of this famous blind man proves that the sense of touch, when trained, can become more delicate than sight, for he distinguished genuine from counterfeit coins (11) by passing his hands over a number of these, although the counterfeits were sufficiently good imitations to deceive a clear-sighted connoisseur; and he judged of the accuracy of a mathematical instrument by passing the tips of his fingers along its divisions. This is certainly more difficult than to judge by touch of the resemblance of a bust to the person represented, and this shows that a blind people might have sculptors and put statues to the same use as among us to perpetuate the memory of great deeds, and of persons dear to them; and in my opinion feeling such statues would give them a keener pleasure than we have in seeing them. What a delight to a passionate lover to draw his hand over beauties which he would know again, when



illusion, which would act more potently on the blind than on those who see, should come to reanimate them! But perhaps, as he would take a deeper pleasure in the memory, his grief would be the keener for the loss of the original.

Saunderson, like the blind man of Puisaux, was affected by the smallest atmospheric change, and could recognise, especially in still weather, the presence of objects not far from him. It is related of him that being present during some astronomical observations taken in a garden, the clouds which hid the face of the sun every now and then from the spectators at the same time caused such a change in the action of the rays on his face as signified to him the moments which favoured or impeded the experiments. You may, perhaps, think that some change in the eye might indicate to him the presence of light, but not of distant objects, and I would have supposed so myself, but for the fact that Saunderson had lost not only his sight but its organ.

Saunderson, then, saw by means of his skin, and this integument of his was so keenly sensitive that with a little practice he could certainly have recognised the features of a friend traced upon his hand, and would have exclaimed, as the result of successive sensations caused by the pencil: "That is so-and-so." Thus the blind have likewise a painting, in which their own skin serves as the canvas. These are no wild fancies, and I am sure if the little mouth of M— were traced on your hand, you would immediately recognise it. Yet you must allow the blind man would find this an easier task than you, accustomed though you are to see and admire that mouth. For two or three elements enter into your recognition: the comparison of the tracery on your hand with the picture formed on the ground of your eye; the recollection of the manner in which we are affected by things felt, and of the manner with which we are affected by things we have only seen and admired; finally, the application of these data to the question of the draughtsman, who asks you when he draws with his pencil a mouth on the skin of your hand: "Whose mouth is this which I am drawing?" Whereas the sum of the sensations aroused by a mouth laid on the blind man's hand is the same as the sum of the successive sensations caused by the draughtsman's pencil.

I might add to this account of Saunderson and the blind man of Puisaux, Didymus of Alexandria, Eusebius the Asiatic, and Nicaise of Mechlin, and some other people who, though lacking one sense, seemed so far above the level of the rest of mankind that the poets might without exaggeration have feigned the jealous gods to have deprived them of it, from fear lest mortals should equal them. For what was Tiresias, who had penetrated the secrets of the gods, but a blind philosopher whose memory has been handed down to us by fable? But let us return to Saunderson and follow the history of this extraordinary man to his grave.

When he was at the point of death, a clergyman of great ability, Mr. Gervase Holmes, was summoned to his side, and they held a discussion upon the existence of God, some fragments of which are extant, and which I will translate to the best of my ability, for they are well worth it. The clergyman began by haranguing on the wonders of nature. "Ah, sir," replied the blind philosopher, "don't talk to me of this magnificent spectacle, which it has never been my lot to enjoy. I have been condemned to spend by life in darkness, and you cite wonders quite out of my understanding, and which are only evidence for you and for those who see as you do. If you want to make me believe in God you must make me touch Him." "Sir," returned the clergyman, very appositely,

"touch yourself, and you will recognise the Deity in the admirable mechanism of your organs."

"Mr. Holmes," replied Saunderson, "I must repeat it, all that does not appear so admirable to me as to you. But even if the animal mechanism were as perfect as you maintain, and I dare say it is (for you are a worthy man and would scorn to impose on me), what relation is there between such mechanism and a supremely intelligent Being? If it fills you with astonishment, that is perhaps because you are accustomed to treat as miraculous everything which strikes you as beyond your own powers. I have been myself so often an object of admiration to you, that I have not a very high idea of your idea of the miraculous. I have had visits from people from all parts of England who could not conceive how I could work at geometry: you must allow such folk not to have been very exact in their notions of the possibility of things. We think a certain phenomenon beyond human power and we cry out at once: 'Tis the handiwork of a god'; our vanity will stick at nothing less. Why can we not season our talk with a little less pride and a little more philosophy? If nature offers us a knotty problem, let us leave it for what it is, without calling in to cut it the hand of a being who immediately becomes a fresh knot and harder to untie than the first. Ask an Indian how the earth hangs suspended in mid-air, and he will tell you that it is carried on the back of an elephant; and what carries the elephant? A tortoise. And the tortoise? You pity the Indian, and one might say to yourself as to him: 'My good friend Mr. Holmes, confess your ignorance, and drop the elephant and the tortoise.'"

Saunderson paused, apparently waiting for a reply, but what possible reply was there to the blind man? Mr. Holmes availed himself of his good opinion of his probity and of the abilities of Newton, Leibniz, Clarke, and some of his fellow-countrymen, men of the highest genius, who had all been impressed by the wonders of nature and recognised an intelligent being as its creator. This was certainly the clergyman's strongest argument. The blind man admitted that it would be presumptuous to deny what such a man as Newton had acquiesced in; yet he represented to the clergyman that Newton's evidence was not of that weight to him, as that of all nature to Newton; while Newton believed on God's word, he was reduced to believe on Newton's word.

"Consider, Mr. Holmes," he added, "what a confidence I must have in your word and in Newton's. Though I see nothing, I admit there is in everything an admirable design and order. I hope you will not demand more. I take your word for the present state of the universe, and in return keep the liberty of thinking as I please on its ancient and primitive state, with relation to which you are as blind as myself. Here you will have no witnesses to confront me with, and your eyes are quite useless. Think, if you choose, that the design which strikes you so powerfully has always subsisted, but allow me my own contrary opinion, and allow me to believe that if we went back to the origin of things and scenes and perceived matter in motion and the evolution from chaos, we should meet with a number of shapeless creatures, instead of a few creatures highly organised. I make no criticism on the present state of things, but I can ask you some questions as to the past. For instance, I may ask you and Leibniz and Clarke and Newton, who told you that in the first instances of the formation of animals some were not headless and others footless? I might affirm that such a one had no stomach, another no intestines, that some which seemed to deserve a long duration from their possession of a stomach, palate, and teeth came to an end owing to some defect in the heart or lungs; that



monsters mutually destroyed one another; that all the defective combinations of matter disappeared, and that those only survived whose mechanism was not defective in any important particular and who were able to support and perpetuate themselves. (12)

"Suppose the first man had his larynx closed, or had lacked suitable food, or had been defective in the organs of generation, or had failed to find a mate, or had propagated in another species, what then, Mr. Holmes, would have been the fate of the human race? It would have been still merged in the general depuration of the universe, and that proud being who calls himself man, dissolved and dispersed among the molecules of matter, would have remained perhaps forever hidden among the number of mere possibilities. If shapeless creatures had never existed, you would not fail to assert that none will ever appear, and that I am throwing myself headlong into chimerical fancies, but the order is not even now so perfect as to exclude the occasional appearance of monstrosities." Then, turning towards the clergyman, he added, "Look at me, Mr. Holmes. I have no eyes. What have we done, you and I, to God, that one of us has this organ while the other has not?"

Saunderson uttered these words in such a sincere and heartfelt tone that the clergyman and the rest of the company could not remain insensible to his suffering, and began to weep bitterly. He noticed it and said to the clergyman, "Mr. Holmes, I was aware of the kindness of your heart, and I am very grateful for the expression of it you have given me just now; but if you love me, do not grudge me my dying consolation of never having caused anyone affliction."

Then, continuing the conversation in a firmer tone, he added: "I conjecture, then, that in the beginning, when matter in a state of ferment brought this world into being, creatures like myself were of very common occurrence. But might not worlds too be in the same case? How many faulty and incomplete worlds have been dispersed and perhaps form again, and are dispersed at every instant in remote regions of space which I cannot touch nor you behold, but where motion continues and will continue to combine masses of matter, until they have found some arrangement in which they may finally persevere? O philosophers, travel with me to the confines of this universe, beyond the point where I feel and you behold organised beings; cast your eyes over this new ocean, and search in its aimless and lawless agitations for vestiges of that intelligent Being whose wisdom fills you with such wonder and admiration here!

"But what is the use of taking you out of your element? What is this world, Mr. Holmes, but a complex, subject to cycles of change, all of which show a continual tendency to destruction; a rapid succession of beings that appear one by one, flourish and disappear; a merely transitory symmetry and momentary appearance of order? A moment ago I reproached you for estimating the perfection of things by your own capacity; I might accuse you here of measuring duration by your own existence. You judge of the phases of the world's existence as the ephemeral insect of yours. The world seems to you eternal, just as you seem eternal to the creatures of a day; and the insect is more reasonable than you. What a prodigious series of ephemeral generations witness to your eternity, what an immense tradition! Yet we shall all pass away without a possibility of denoting the real extent which we took up, or the precise time of our duration. Time, matter, and space are perhaps but a point."

During this conversation Saunderson became more excited than his state of health would permit, and an attack of delirium ensued, which lasted several hours. At its close he cried, "O thou God of Clarke and Newton, have mercy on me!" and expired.

Such was the end of Saunderson. You see, madam, that all the arguments of the clergyman he took exception to were not of a character to convince a blind man. What a disgrace to men who have no better argument than he; men who have eyes, to whom the marvellous spectacle of nature from sunrise to the setting of the smallest stars reveals the existence and glory of its Maker! They have sight, which Saunderson was deprived of, but Saunderson was blessed with a purity of life and uprightness which we look for in vain in them. Accordingly they lead the life of the blind, and Saunderson died as if he knew the light. The voice of nature made itself clear to him by the media of the senses he possessed, and his evidence is the more convincing against those who obstinately shut their eyes and ears. Was not the true God more completely veiled by the mists of paganism for a Socrates, than for the blind Saunderson, who never enjoyed the spectacle of nature?

I am very sorry, madam, both for your sake and mine, that no further interesting particulars of this famous blind man have been handed down. His conversation would perhaps have afforded more light than all our experiments. Those about him must have been devoid of the philosophic spirit. I make an exception in favour of his pupil, Mr. William Ingham, who only saw Saunderson during his last moments, and who took down his last words, which I should advise all who know English to read in the original, printed in Dublin in 1747, and entitled *The Life and Character of Dr. Nicholas Saunderson, late Lucasian Professor of the Mathematicks in the University of Cambridge*; by his disciple and friend William Ingham, Esq. (13) They will find a charm, and a vigour in this, scarce ever paralleled, but which I do not flatter myself I have conveyed in translation, in spite of all my care.

He married in 1713 the daughter of Mr. Dickons, rector of Boxworth, in the county of Cambridge, and had by her a son and daughter who are still living. His farewell to his family was exceedingly moving. "I go," said he, "to our common destination; spare me laments which unman and unnerve. The expressions of grief which escape you only make me conscious of my own. I gladly give up a life which has been for me a long desire, a constant privation. Live on, as virtuous as I, but more fortunate, and learn to die with equal calm." He then took his wife's hand, which he held for a moment clasped in his own; he turned his face towards her as if he desired to see her; he blessed his children, embraced them, and begged them to leave him, because they caused him greater grief than the approach of death.

England is the land of philosophy and of scientific inquiry, yet without Mr. Ingham we should only know what the common man could have narrated of Saunderson; for instance, that he recognised places he had once visited by the sound the walls and pavement reflected, and many similar anecdotes, all equally common to the majority of the blind. Strange! Are blind men of such high intellectual abilities as Saunderson of common occurrence in England, and are men born blind who lecture on optics to be met with every day?

People try to give those born blind the gift of sight, but, rightly considered, science would be equally advanced by questioning a sensible blind man. We



should learn to understand his psychology and should compare it with ours, and perhaps we should thereby come to a solution of the difficulties which make the theory of vision and of the senses so intricate and so confused. But I own I cannot conceive what information we could expect from a man who had just undergone a painful operation upon a very delicate organ which is deranged by the smallest accident and which when sound is a very untrustworthy guide to those who have for a long time enjoyed its use. For my part, as to the theory of the senses, I would sooner hear a metaphysician who was acquainted with the principles of metaphysics, the elements of mathematics, and the conformation of the organs of sense, than an uneducated man whose sight was first due to an operation for cataract. I would have less confidence in the impressions of a person seeing for the first time than in the discoveries of a philosopher who had profoundly meditated on the subject in the dark; or, to adopt the language of the poets, who had put out his eyes in order to be the better acquainted with vision.

To obtain some certainty in such experiments the subject must at least have been prepared a long time beforehand; he should be made a philosopher—no rapid process even with a philosopher for teacher! And imagine the task if the teacher were not enlightened, or (worse still) fondly and mistakenly imagined himself enlightened! It would be better to postpone the investigation to a considerable period after the operation. To do this, the patient would have to remain in darkness, and the investigator would have to see to it that his wound was healed and his eyes perfectly sound. I would not expose him to full daylight for the first time. A strong light dazzles our eyes; what effect will it not have on an organ which cannot but be extremely tender and sensitive, and which has never yet felt any impression to blunt it?

But this is only the beginning. It would be a difficult and delicate task to reap any benefit even from a person thus prepared, and to adapt our questions so that he may precisely say only what passes in himself. This interrogatory should be held in presence of the Academy; or rather, to avoid the presence of idle spectators, only such as deserve that distinction by their knowledge of philosophy, anatomy, etc., should be invited.

The task would not be beneath the intelligence of the best and wisest of men; to train and question one born blind would be an occupation worthy of the combined talents of Newton, Descartes, Locke and Leibniz.

I will end my letter, which I own is already too lengthy, by a problem which was propounded some time ago. Some reflections upon Saunderson's singular condition tend to show that it has never been absolutely solved. Suppose one blind from birth had been taught to distinguish by touch a cube and a sphere of the same metal and of approximately the same size, so that when he touches them he can say which is the cube and which is the sphere. Suppose the cube and sphere placed on a table and the blind man suddenly to see; can he distinguish the cube from the sphere by sight without touch?

Mr. Molyneux first stated this problem and attempted to solve it. He declared that the blind man would not distinguish between the cube and the sphere; "for," said he, "though he has learnt by experience the effect of a sphere and a cube upon the sense of touch, he does not yet know that what affects his sense of touch in such and such a manner must affect his sight thus or thus; nor that the projecting angle of the cube which presses against his hand should appear to his eyes as it actually does appear in the cube."

Locke, when consulted on this point, said: "I certainly agree with Mr. Molyneux's opinion. I believe the blind man incapable at first sight of affirming with any certainty which was the cube and which the sphere if he merely looked at them, although, if he touched them, he could name them and distinguish between them by the difference of their shape, which he would recognise by touch."

The Abbé de Condillac, whose *Essay on the Origin of Human Knowledge* you have read with so much pleasure and profit, and whose excellent *Treatise on Systems* accompanies this letter, makes an original contribution to the question. I shall not repeat his arguments here, since you will have the pleasure of reading his book in which they are expounded in such an entertaining and yet such a philosophical manner that it would be a mistake on my part to tear them from their context. I shall merely observe that they all tend to prove that the born-blind either sees nothing, or distinguishes between the sphere and the cube; and that the conditions that these two bodies should be of the same metal and of approximately the same size (which was postulated in the problem) are unnecessary, which cannot be disputed; for he might have said, if there be no essential connection between the sensations of the sight and the touch (as Messrs Locke and Molyneux assert), they must admit that a body may to the eye appear to have two feet in diameter which yet would vanish on being touched. De Condillac adds, however, that if the blind man sees bodies and distinguishes their forms, and yet hesitates what to think about them, it must be from metaphysical reasons, and those not a little subtle, which I shall presently explain. We have here two different opinions on the same question—a difference between philosophers of the highest rank. One would suppose, after the problem had been studied by men such as Messrs Molyneux, Locke and the Abbé de Condillac, that nothing more could be said; but the same thing can be viewed from so many different sides that it is not strange if they have not exhausted all its possibilities.

Those who declare that a man blind from birth could not distinguish between a cube and a sphere have set out by assuming a fact which perhaps should have been investigated; that is, whether a blind man who has had his cataracts removed is in a condition to use his eyes immediately after the operation. They merely say: "The blind man, comparing the ideas of spheres and cubes which he has received by the sense of touch with those received by sight, will necessarily know them to be the same; and it would be indeed odd if he were to name that body a cube which gives the eye the idea of a sphere, and sphere that which gives the idea of a cube. He will therefore call those bodies spheres and cubes at sight which he called spheres and cubes by the sense of touch."

But how do their antagonists reply? They have also taken for granted that the blind man could see immediately his organ was perfect; they supposed that an eye couched for cataract was like an arm that ceases to be paralysed. As the latter does not need exercise before it feels, they said, neither does the former before it sees; and they added: "Let us grant the blind man a little more philosophy than you afford him, and after carrying on the reasoning where you left it, he will continue thus: 'But still, who is to assure me that when I approach these bodies and touch them with my hands they will not on a sudden deceive my expectation, and that a cube will not give me the sensation of a sphere and a sphere of a cube? Experience alone can teach me whether there be an analogy between sight and touch. The reports of these two senses may well be contradictory without my knowing it; nay, I should perhaps suppose what is actually present to the sight to be only a mere appearance, had I not



been informed that they are the very same bodies I had touched. This object certainly seems to be the body which I called a cube; and that, the body I called a sphere; but the question is, not what I think, but what is; and I am not in a position to answer the latter question satisfactorily."

The line of argument, says the author of the *Essay on the Origin of Human Knowledge*, would be extremely perplexing to him who had been born blind, and I see nothing but experience which can furnish an answer to it. It seems probable that the Abbé de Condillac means only the experiment repeated by the blind man himself on a second handling of these bodies. You will soon perceive why I make this point. That able metaphysician might have added that the blind man would be the more inclined to suppose that two senses might be mutually contradictory, as he conceives that a mirror makes them mutually contradictory, as I have noticed already.

De Condillac proceeds to observe that Molyneux has confused the issues of the problem by laying down several conditions which are irrelevant to the metaphysical difficulties which the blind man would experience. This criticism is the more just, as the supposition of the blind man being acquainted with metaphysics is not at all out of the way; because the experiment in all such philosophical questions should be accounted to be made on a philosopher—that is to say, on a person who perceives in the questions propounded all that his reason and the state of his organs permit him to perceive. Such, briefly, are, madam, the pros and cons of the problem; and you shall now see by my examination of it how very far they, who asserted that the blind man would see geometrical figures and distinguish between them, were from realising that they were right; and what good reason their opponents had to think that they were not in the wrong.

This problem of the blind man, stated in somewhat more general terms than by Molyneux, embraces two problems which we will consider separately. We may ask (1) if the blind man would see immediately after the operation for cataract; (2) supposing he is able to see, could he see well enough to distinguish between figures; could he, in seeing them, correctly give them the same names which he gave them by the sense of touch; and if he can, prove that these names are the right ones?

Will the man born blind see immediately after the cure of the organ? Those who maintain that he will not see, say: "Directly the blind man is able to use his eyes, all the scene before him is represented at the back of the eye. This image, which is composed of a number of objects concentrated in a very small space, is but a confused mass of figures which he will not be able to distinguish. People are on the whole agreed that it is only experience which can enable him to judge of the distance of objects, and that he is obliged to approach, touch, draw back from, and again approach and touch them to assure himself that they are not part of himself and are foreign to his essence; that he is now near and now far from them. Why should not experience be a necessary preliminary for perceiving them? Without previous experience he who perceives objects for the first time would suppose, when he is out of sight of them, that they had ceased to exist; for it is only our experience of permanent objects and such as we find again in the same place where we left them which evidences the continuity of their existence when out of our sight. It is perhaps for this reason that children are so readily consoled for toys taken from them. It cannot be said that they promptly forget them, for some children only two and a half years old know a

considerable number of words of a language and are more at a loss to pronounce them than to retain them. Now, this is a proof of childhood's being the very season of memory.

Is it not a more likely hypothesis that children think that what they no longer see no longer exists, especially as their joy when things they have lost sight of appear again is mixed with surprise? Nurses help them to acquire the notion of the continuance of absent persons by playing a game which consists in hiding the face, and showing it again. Thus they learn a hundred times in a quarter of an hour that what ceases to appear does not necessarily cease to exist. Whence it follows that we owe the notion of the continuous existence of objects to experience, of their distance to the sense of touch; that the eye may perhaps have to learn to see as the tongue to speak; that it would not be surprising should the aid of one of the senses be necessary to another; and that touch, which ascertains the existence of objects exterior to ourselves when present to our eyes, is likewise the sense to which the confirmation not only of their figures, and other details of these objects, but even their presence, is reserved.

To these arguments may be added the famous experiment of Cheselden. The young man from whose eyes this skilful surgeon removed cataracts was for a long time unable to distinguish dimensions, distances, positions, or even figures. An object an inch in size held before his eye so as to hide a house from him appeared as large as the house itself. All he saw seemed as close to his eye as the object he touched to the skin. He could not distinguish what he judged round by touch from what he had judged angular; nor distinguish by sight whether what he had felt to be above or beneath him were in reality above or beneath him. He eventually succeeded, but not without difficulty, in perceiving that his house was larger than his room, but he could not conceive how this could be ascertained by sight. Repeated experiments were necessary before he became assured of paintings representing solid bodies; and when he was quite convinced by looking at pictures that what he saw was not bare surfaces, on putting his hand to a picture he was vastly surprised at finding a plane surface without any relief. He then asked which was deceptive, the sense of touch or the sense of sight? Painting likewise has the same effect on savages. They take the painted figures for living men, question them and are astonished at receiving no answer; and this error in them certainly did not proceed from their not being accustomed to see.

But what can be answered to the other difficulties? That the trained and practised eye of a man sees better than the weak and untrained organ of an infant, or of one born blind who has had his eyes couched. Look, madam, at the proofs adduced by the Abbé de Condillac at the end of his *Essay on the Origin of Human Knowledge*, where he also adduces Cheselden's experiments as related by Voltaire. The effects of light upon an eye for the first time so affected, and the conditions required in humours of that organ, the cornea, the crystalline lens, etc., are clearly and ably specified therein, and leave little doubt that the vision of an infant opening its eyes for the first time, or a blind person who has just been operated upon, is very imperfect.

We must, therefore, admit we perceive a multitude of details in objects unperceived by the infant or one born blind, though these objects are equally represented at the back of their eyes; for objects to strike us is not enough—we must further attend to these experiences; that, consequently, we see nothing



the first time we use our eyes; and during the first moments of sight we only receive a mass of confused sensations, which are only disentangled after a time and by a process of reflection. It is by experience alone that we learn to compare our sensations with what occasions them; that sensations having no essential resemblance with their objects, it is from experience that we are to inform ourselves concerning analogies which seem to be merely positive. In short, that touch is of great service in giving the eye an accurate knowledge of the conformity of the object to the sense-impression received of it is unquestionable; and I am much inclined to think that were not everything in nature subject to laws infinitely general—if, for instance, the pricking of certain hard bodies were painful, and that of certain other bodies pleasurable—we should die before we had received the hundred-millionth fraction of the experiences necessary for the preservation of our body and our well-being.

I am not, however, of opinion that the eye is incapable of learning, or, if I may say so, of experimenting alone. To ascertain the existence and form of objects by touch, there is no necessity of seeing; why should touch be necessary for complete realisation of the same objects by sight? I am awake to all the advantages of touch; I have not disguised them in these observations on Saunderson or the blind man of Puisaux; but I cannot allow it that prerogative. It is easy to see that the use of one sense may be perfected and accelerated by the observations of another; but not that there is an essential interdependence between their functions. There exist certainly properties in bodies which we should never perceive without touch; and by touch we learn the presence of certain details invisible to the eye, which only becomes aware of these when informed by the sense of touch; but their services are mutual; and in the case of persons who have sight more highly developed than touch it is the former which warns the latter of the existence of objects and of details which would pass unnoticed from their minuteness. If unknown to you a piece of paper or some smooth, thin, and flexible substance were placed between your thumb and index finger, it is your eye alone which would inform you that the contact between your two fingers was not direct. It would be much more difficult, I may cursorily add, to deceive a blind man than a person used to see in this.

An eye which is in sound condition and freely exercised might have some difficulty in convincing itself that exterior objects are not part of itself; that some things are distant, some near; that they have forms; that some are larger than others; that they have depth, etc.; still, I make no doubt that at length it would come to see them, and to see them so distinctly as to distinguish at least their more obvious limits.

To deny this would be to set aside the aim and object of the organs; it would be forgetting the chief phenomena of vision; it would be concealing from oneself that there is no painter of such skill as to rival the beauty and exactness of the miniatures which are painted in the back of your eyes; that there is nothing more exact than the likeness of the representation to the object itself; that the canvas of this picture is not so very small, that there is no confusion among the various forms, and that they occupy about a square half-inch; and that nothing is more difficult to explain than how the sense of touch would begin to teach the eye to see were the use of the latter organ absolutely impossible without the aid of the former.

But, instead of bare presumptions, I ask you whether it is touch that teaches the eye to distinguish colours? I do not suppose such an extraordinary

claim will be made for touch; and this being so, it follows that if a blind man who has just been given the gift of sight is shown a black cube or a red sphere on a white background, he will immediately discern the several outlines of these figures.

Delay will be caused, some may object, by the time which must elapse for the humours of the eye to assume their proper dispositions, for the cornea to assume the convexity requisite for vision, for the pupil to be susceptible of the dilation and contraction proper to it, for the filaments of the retina to be sensitive in the right degree to the action of light, for the crystalline to exercise its forward and backward movement or for the muscles to fulfil their functions well, for the optic nerves to become accustomed to the transmission of sensation, for the entire eyeball to accommodate itself to all the necessary dispositions, and for all its component parts to combine in the execution of that miniature, which so much illustrates the demonstration that the eye will bring itself to the requisite experience.

I own that, plain as the picture is which I have now represented to the eye of one born blind, he will not be able clearly to distinguish its parts until all these above conditions are combined; but that is perhaps the work of a moment; and it would not be difficult, by applying the aforesaid argument to a complicated mechanism such as a watch, to prove by enumerating all the movements which take place in the drum, the fusee, the wheels, the pallets, the pendulum, etc., that the hand would take a fortnight in moving the space of a second. If it is objected that these movements are simultaneous, I reply that so perhaps are the movements in the eye when it opens for the first time, and most of the consecutive judgments. Whatever are the conditions in the eye requisite for vision, it must be granted that it is not touch which imparts them to it, that the organ acquires them independently; consequently, will succeed in distinguishing the figures represented therein without the aid of another sense.

But when does this occur?, some will say. Perhaps far sooner than is thought. When we went together to the Jardin Royal, do you remember the experiment with the concave mirror and your fright when you saw the point of a sword making at you with the same swiftness as the point of that which you pushed towards the surface of the mirror? And yet you were sufficiently accustomed to refer objects represented in mirrors to something beyond them. Experience, therefore, is not so very necessary, nor so infallible as imagined, for perceiving objects or their images where they are. Your very parrot gives proof of it. The first time he saw himself in a mirror, he touched it with his beak, and as he did not reach himself (whom he took for a fellow-parrot) he walked round the mirror. I am not for laying more than due weight on the instance of the parrot; still, it is an experiment with an animal in which preconceived notions cannot be supposed to have any share.

Yet if I were told that a man born blind saw nothing for the space of two months, I should not be surprised. I shall only conclude from it the necessity of the organs becoming practised, not the necessity of touch. It will be another reason why it is important to let such a person remain for some time in the dark, when he is to be the subject of experiment; to allow him the opportunity of exercising his eye, which will be done more conveniently in the dark than in full daylight; and only to permit a kind of twilight during the experiments, or at least to arrange for the increasing or diminishing of light at pleasure in the spot where the experiments take place. I shall only be the more inclined to



agree that such experiments will always be very difficult and uncertain; and that the best and shortest (though superficially the longest) way would be to arm the subject with a philosophical training sufficient to enable him to compare the two conditions he has known, and to acquaint us with the difference between the state of a blind person and of one who has his sight. Once more, what precision is to be expected from one who has not the habit of thought and analysis, and who, like Cheselden's blind man, is so ignorant of the benefits of sight as to be insensible to his misfortune, not conceiving that the lack of this sense very much impairs his pleasure? Saunderson, who certainly deserves the name of philosopher, was not thus indifferent, and I doubt much whether he would have agreed with the author of the excellent *Treatise on Systems*; I suspect the latter to have fallen into a "system" himself when he writes that, "had the life of man been only an uninterrupted sensation of pleasure or of pain, happy without prospect of pain, wretched without any prospect of pleasure, he would have rejoiced or suffered; and that if he were so constituted, he would not have looked about him to discover if some influence were well disposed towards him, or desired to injure him; it is only the alternation between these two conditions which causes him to reflect," etc.

Can you believe, madam, that by a clear train of reasoning (for that is the author's method of philosophising) he would ever have been led to this conclusion? It is not with happiness and misery as with light and darkness; the one is not simply the privation of the other. We might, perhaps, have entertained the idea that happiness was as essential to us as existence and thought, had we enjoyed it without intermission; but I cannot say the same with regard to unhappiness. It would have been very natural to look on it as a forced condition, to feel oneself innocent, yet to believe oneself guilty and to accuse or excuse nature as at present.

Does the Abbé de Condillac suppose that a child in pain only cries from his pain not having been without intermission from his birth? If he replies that "existence and pain would be one and indivisible for one who had always suffered, and that such a one could not imagine cessation of suffering without cessation of his existence," I make reply: "The man living in continual misery possibly might not have said, 'What have I done that I should suffer thus?' but why might he not have said, 'What have I done that I should be brought into being?'" At the same time, I see no reason why he should not have used his two synonymous verbs, I exist and I suffer, the one in prose, the other in poetry, as we use the two expressions, I live and I breathe. Moreover, madam, you will observe better than I do that this passage of the Abbé de Condillac's is admirably fine, and I fear you may say, after comparing my criticism with his reflections, you prefer an error of Montaigne's to a truth of Charron's.

You may blame my continual digressions. But digressions are of the essence of this treatise. Now my opinion on the two foregoing questions is this: the first time the eyes of one born blind open to the light, he will see nothing at all; some time will be necessary for his eye to practise sight; it will practise alone and without the aid of touch, and will eventually distinguish not only colours but the main outlines of objects. Supposing he acquired this aptitude in a very short space of time, or acquired it by using his eyes in the dark apartment in which he had been confined and urged to use that exercise for some time after the operation and before the experiments; let us now see whether he would recognise at sight the bodies he had touched, so as to give them the proper appellations. This is the final question.

In order to treat the question in the manner you will appreciate—for you like method—I will classify the persons on whom the experiment might be made. If they are dullards without education and knowledge and also unprepared, I hold that when the operation for cataract has completely removed the defect of the eye and the eye is in a healthy state, objects would be very distinctly pictured in it; but such patients, being unaccustomed to any kind of reasoning and not knowing anything of sensation or idea, would be unable to compare the sensations they had received by touch with those they now receive by sight, and would at once exclaim, "There is a round, there is a square," so that their judgment is not to be relied on; or even they will possibly own that they saw nothing in the objects present to their sight like what they have handled.

Another class there is, who by comparing the forms they see with the bodies that had previously made an impression upon their hands, and mentally applying touch to distant objects, would describe one body as a square, and another as a circle without well knowing why, their comparison of the ideas they have acquired by sight not being sufficiently distinct in their minds to convince their judgment.

I pass to a third class of subject, a metaphysician. He, I make no doubt, would, directly he began to see objects clearly, reason as if he had seen these bodies all his life; and after comparing the ideas acquired by sight with those acquired by touch he would declare as confidently as you or I: "I am very much inclined to think that this is the body which I have always called a circle, and that again what I named a square, but will not assert it to be really so. What is to prevent their disappearance if I were to touch them? How am I to know whether the bodies I see are also meant to be touched? I do not know whether visible things are palpable; but were I assured of this, and did I take the word of those about me that what I see is really what I have touched, I should be no better off. These bodies may transform themselves in my hands and transmit on contact sensations quite different from those resulting from sight. "Gentlemen," would he conclude, "this body appears to be the square, that the circle; but that they are the same to touch as to sight is what I have no knowledge of."

If we take as our subject a geometrician instead of a metaphysician, he will likewise say of the two figures he has before his eyes, one is what he used to call a square, the other what he used to call a circle: "For I see," he would add, "that it is only in the former I could arrange my threads and insert my large-headed pins which denoted the angles of the square; and only in the latter figure I could place the threads I required to demonstrate the properties of a circle. Here is a circle, then, and here is a square. But," he would have added with Locke, "perhaps when I lay my hands on these figures they will change one into another, so that the same figure would serve me in demonstrating the properties of a circle to the blind and the properties of a square to the sighted. I might possibly see a square and at the same time feel a circle. No," he would have continued, "I am wrong. Those to whom I demonstrated the properties of the circle and the square had not their hands on my abacus, and did not touch the threads which I had stretched to outline my figures, and yet they understood me; they therefore did not see a square when I felt a circle, otherwise we should have been at cross-purposes; I should have been outlining one figure and demonstrating the properties of another, I should have given them a straight line for the arc of a circle, and an arc for a straight line: but as they all understood me, all men see alike: what they saw as a square, I see as a square; what they saw as a circle, I see as a circle. So this is what I have



always called a square and that is what I have always called a circle." I have substituted a circle for a sphere and a square for a cube, because there is reason to think that we only judge of distances by experience; and of course he who uses his eyes for the first time sees only surfaces without knowing anything of projection, since a projection consists in certain points appearing nearer to us than others.

But even if the blind man were able in his first attempt to judge of the projection of solidity of bodies and distinguish not only a circle from a square but likewise a sphere from a cube, yet I do not therefore think that this will hold good with regard to the case of more composite bodies. There is reason to suppose that Monsieur de Réaumur's blind woman distinguished between colours, but the odds are thirty to one that what she said of the sphere and the cube was purely guesswork. I am firmly persuaded that it was not possible for her (without inspiration) to recognise her gloves, her dressing-gown, and her shoes. These objects are so composite and full of detail; there is so little resemblance between their total shape and that of the limbs they are designed to adorn or cover that Saunderson would have been infinitely more perplexed to find out the use of his mortar-board than d'Alembert or Clairaut to discover the use of his tables.

Saunderson would infallibly have supposed a geometrical relation between the object and its use, hence he would have recognised that his skull-cap was made for his head, for this had no arbitrary form to confuse him. But what would he have thought of the points and tassel of his mortar-board? What was the use of the tassel, or why four points rather than six? And these two ornamental peculiarities would for him have been the source of a number of absurd theories, or rather an excellent satire upon what we call good taste.

Taking everything into mature consideration, it will be admitted that the difference between a person who has always seen, but to whom the use of an object is unknown, and one who knows the use of an object, but has never seen, is not to the latter's advantage. Yet, do you think, madam, if you were shown a head-dress to-day for the first time, you would ever guess it to be an ornament, and particularly intended for the head? But if it be more difficult for one born blind and seeing for the first time to form a correct idea of complex objects, what is there to prevent him taking a person dressed and sitting motionless in an arm-chair for a machine or a piece of furniture, and a tree with its leaves and branches tossed by the wind for a self-moving, animated, and thinking being? How much our senses suggest to us; and were it not for our eyes how apt should we be to suppose that a block of marble thinks and feels!

It is certain, therefore, that Saunderson would have been assured of his not being mistaken in the judgment he had just given of the circle and the square, and that there are cases when the reasoning and experience of others are of value in elucidating the relation of sight to touch, and in teaching that what a thing is to the eye, it is likewise to touch.

It would, however, be not the less essential in demonstrating some proposition of universal application (as it is termed) to test the proof by depriving it of the evidence of the senses; for you are very well aware, madam, that if some person attempted to prove to you that two parallel lines seen in perspective are to be represented in a picture by two converging lines, because the two sides of an avenue appear to converge, it would be forgetting that the proposition is as true for one that is blind as for himself. But the foregoing supposition

of one born blind suggests two others: firstly, of a man who had always seen, but was devoid of the sense of touch; secondly, of a man in whom the senses of sight and touch were mutually contradictory. We might ask the former whether, if the missing sense were given him, or sight were obscured by a bandage, he would recognise bodies by touch. It is clear that geometry (provided he were acquainted with that science) would be an infallible guide as to whether the evidence of the two senses were contradictory or no. All he would have to do would be to take the cube or sphere in his hand, and demonstrate its properties, and pronounce that what he feels a cube is a cube to the eye; hence it is a cube he holds. As to one who is ignorant of this science, I believe he would not more easily distinguish a cube from a sphere by touch than Molyneux' blind man distinguished them by sight.

In the case of a man in whom the sensations of sight and touch are in a perpetual contradiction, I do not know what he would think of shapes, order, symmetry, beauty, ugliness, etc. In all probability he would be with regard to those things as we are with regard to the real extension and real duration of beings. He would, in general, say that a body possesses a shape, but he must be inclined to think that it is neither that which he sees nor that which he feels. Such a one might be dissatisfied with his senses, but his senses would be neither satisfied nor dissatisfied with the objects. Were he inclined to charge one sense with inaccuracy, I imagine it would be touch. A hundred circumstances would incline him to think that the form of objects changes rather by the action of his hands upon them than by that of the objects on his eyes. But in consequence of these preconceived notions, the difference between hardness and softness which he would find in bodies would be very perplexing to him.

But does it follow that figures are better known to us because our senses are not self-contradictory? Who has told us that they are not false witnesses? Yet we pass judgment. Alas! madam, when we weigh our human knowledge in Montaigne's scale, we are almost reduced to adopting his motto. For what do we know? What of the nature of matter? Nothing. What of the nature of spirit and thought? Still less. What of the nature of movement, space and duration? Absolutely nothing. What of the truths of geometry? Ask any honest mathematicians, and they will own to you that all their propositions are identical, and that so many volumes upon the circle (for example) are nothing but repetitions by a hundred different methods that it is a figure where all the lines drawn from the centre to the circumference are equal. Thus we scarce know anything, yet what numbers of books there are whose authors have all pretended to knowledge! I cannot think why the world is not tired of reading so much and learning nothing, unless it be for the very same reason that I have been talking to you for two hours, without being tired and without telling you anything. (14)

With profound respect,

I am, madam,

Your very humble and obedient servant. (14)



## FOOTNOTES

1. (The original is: *Possunt quia possunt videntur*—"They succeed because they think they will succeed.")
2. Hilmer, A Prussian oculist.—(Br)
3. A small town in the Gâtinais.—(D)
4. Lieutenant of police.—(Br)
5. Clément (*Cinq années littéraires*, lettre xxxiii) chooses this passage to give his correspondent some idea of this new book of Diderot's which he describes as obscure, and in which he only finds a very slight exhibition of learning.—(A)
6. (Brière gives the name of this geometrician as Rapson (sic). Raphson, not a very distinguished mathematician, may, among many others, have quoted this doctrine of Plato, but it is not very important if he did so. What makes the dictum important in Plato's mouth is that he had a theory that geometry is more fundamental and comprehensive than arithmetic. He disagreed in this respect from the Pythagoreans because he clearly realised that there were certain lengths of lines expressible geometrically but not arithmetically; cf. Brunschvicg, *Les étapes de la philosophie mathématique*, pp. 45, 47, 48.)
7. Printed in London, a year after Saunderson's death, at the expense of Cambridge University. In 1756 de Joncourt translated it, with some additional remarks (Amsterdam, 2 vols.).—(Br)
8. Naigeon, and after him the editor of 1818, have inserted, instead of the initials M. de M ... in the original edition, M. de Montesquieu. This is a great mistake; Diderot himself has given M. de Marivaux in the index of the 1749 and 1751 editions. The *Esprit des Lois* appeared in 1748, which might have caused this error on the part of the editors, who had not consulted the index.—(Br)
9. *Dialogues between Hylas and Philonöus* (1713), translated by the Abbé Gua de Malvin (1750).—(A)
10. Condillac (1715–1780), whose *Essay on the Origin of Human Knowledge* had appeared anonymously in 1746.—(A)
11. *Memoirs of the life and character of Dr. Nicholas Saunderson* in Saunderson's *Algebra*, vol. i, p. xi (1740).
12. This is the theis of Lucretius, and the theory of the survival of the fittest.—(A)
13. By rendering a Dr. Inchlif responsible for his imaginary reconstruction of Saunderson's last moments Diderot alienated the sympathies of England.—(A)
14. (This translation has been collated with an eighteenth-century translation, undated and anonymous, entitled a *Letter on Blindness*.)





# DENIS DIDEROT: A PORTRAIT

*By C. Warren Bledsoe*

Denis Diderot's "Letter on the Blind for the Use of Those Who See," has the special interest of all writings which have caused the imprisonment of their authors. As the only great 18th libertarian document concerning blindness, it has been commended to disciples by succeeding generations of workers for the blind in the emancipated tradition of Howe. But as the years have gone on, it has passed into that common category of great writings which are suddenly not available except by inter-library loan even in civilized communities.

Moreover, once blessed by the disapproval of the King's censor, it has lately been given the deathly kisses of scholars. This is a lamentable fate for the thinking of a brilliant generalist who turned his attention to affairs and problems of blind people, and who on a broader front waged a lifelong war against tyranny over the mind of man, who said among other things, "We must enlarge God" and "The first step in philosophy is incredulity." With Rousseau and Voltaire he was in the grand style of human rebel and fomenter of change by wile, hook and crook. Happily he was also one of those revolutionaries who did not live to see the Terror. His dates were 1713 till 1784.

The great work of his life was his Encyclopedia which, from the spirit in which it was written, was called "not a dictionary, but a political party, the party of destruction." However, Voltaire saw him in a different light, calling him Pantophile—"lover of all things."

His interest in blindness was typical of his omniverous curiosity and his writings on the subject a striking example of the "one-shot operation" by which light is shed on work for the blind by a passerby of unusual quality and vitality.

With the eccentricity of genius, he was led into the episode, not through interest in blind people at first, but to get money for a needy friend by plying his trade as a writer. Ironically, this kindly impulse produced a work which was to involve him in trouble with the authorities and land him in prison. This came of his attending an experiment involving a surgical operation for removal of cataract in the process of gathering material on the subject of blindness. In criticizing what he considered to be the unscientific nature of the proceedings, Diderot ruffled feelings of persons in a position to influence the Government, then highly sensitive with respect to the thinkers of France, and in fact ready to pounce on them. He was imprisoned for 28 days without seeing anyone but a police lieutenant. After that, both he and his wife were ordered to Vincennes, where he was informed that the King by an "excess of clemency" allowed him to be a prisoner on parole and take exercise in the park. After three months he was allowed to go home.

He left a note on the wall of his cell which told future occupants that ink could be made with wine and slate ground to a very fine powder, and a pen with a tooth-pick. By this means Diderot had entered his prison reflections in a copy of Milton's 'Paradise Lost' which he had been allowed.

His approach to philosophy and to learning was highly practical. His encyclopedia contained enormously detailed information about every phase of human civilization, including highly technical industrial mechanisms. He wrote learned discourses on acoustics, air resistance, tension, attended lectures of a noted chemist for three years, taking 1,500 pages of notes.

In the making of his encyclopedia he demonstrated great skill in mustering resources to sustain the undertaking and outwitting the highly reactionary forces of the Bourbon government. To him the project was an opportunity to strike a blow against stultifying tradition both in church and state through the advancement of knowledge. Toward this end he gathered active and devoted workers, among them, litterateurs, scientists and even priests, some well established, others at the beginning of their careers, but all unified by the spirit to challenge the old regime. Like Bacon, Diderot saw knowledge as a phenomenon which his method could reveal as an organized whole.

The work on the encyclopedia took 17 years, having a checkered career, during which Diderot out-maneuvered censors who were neither too alert, nor truly purposeful, so that the ultimate outcome was never in serious doubt. Meanwhile he was undaunted by cabals of enemies or desertion of friends, and was rewarded by the protection of the Marquise de Pompadour during one brush with authorities.

His most devastating experience was to discover in 1764 that his publisher had secretly removed compromising material from the corrected proof. A collection of Diderot's writings at Leningrad enables a modern critic to compare the text as Diderot intended it with that printed, and, though to the latter-day reader the differences do not appear important, they lay at the heart of his philosophy. He never forgave the publisher.

The Diderot collection in Leningrad is the result of the rather extraordinary friendship he developed with Catherine the Great of Russia at the end of his career, when the completion of the encyclopedia left him without regular employment. To relieve him of financial worry, Catherine first bought his library for a substantial sum through an agent in Paris, with a request that he retain the books in Paris until she required them; she then appointed him librarian with a yearly salary for the duration of his life. Diderot went to St. Petersburg to thank her and was received with honor and warmth. He wrote for her the "Plan for a University for the Government of Russia." She put a house in Paris at his disposal. After his death his books and copies of all his manuscripts were dispatched to Catherine by his daughter, a strange ending to Diderot's lifelong opposition to benevolent despotism.

Though a worthy adversary, Diderot was not a bitter ender. Concerning Boucher's painting he spun out a long enterprise of criticism on the theme, "The man has all but truth." But learning that his victim was dead, leaving an unfinished Venus on his easel he said, "I have said too much evil of Boucher, I retract."



Puckishness in Diderot, especially as a young man, was an embarrassment not merely to his enemies, but to his supporters. This was most likely to be apparent when he was assailing orthodox opinion. A definite flaw in the "Letter on the Blind" is the invention of a book which never existed by an author, Dr. Inchcliff—who also was a creature of Diderot's imagination. He had no shame over a double standard of sincerity where the censors of the Bourbons were concerned. His habitual devotion to fact, apparent through the major part of the essay, has procured him the pardon of his editors for the curious prank of inventing Inchcliff. But since in so doing he ascribed atheism to a pious member, (Nicholas Saunderson) the Royal Society of London would never admit him to corresponding membership.

Diderot is somewhat subjective in beginning his "Letter on the Blind" with insinuations against the integrity of the unnamed medico who refused to allow him and others to view the removal of bandages from the eyes of a cataract patient. In actual fact the physician was de Réaumur, one of the most perceptive biologists of the time.

Concerning this lapse into prejudice, Diderot's "Pensées philosophique" might speak for him: "Say a word in favor of reason's rivals, since it is only the passion that can raise the soul to great things. Without the passions there would be nothing sublime, either in morals or in works; the arts would return to their infancy, and virtue would be limited to petty deeds."

There was, in fact, nothing petty about Diderot. In the words of Dr. Berthold Lowenfeld, "He was one of the new universal geniuses of his time and had immense influence over the writers, not only of France but also of England and Germany."











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